When a close friend or relative dies by suicide:

the impact on mental health and social functioning of young adults

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PhD Thesis

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Declaration:

I, Alexandra Pitman, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Abstract:

Introduction: Provision of support for people bereaved by suicide has become a key priority for suicide prevention strategies in many developed countries. Few studies have measured whether suicide bereavement increases risk of suicidal behaviour compared with bereaved controls.

Methods: I sampled 659,572 staff and students at 37 UK higher education institutions in 2010. Via mass email, I invited adults who had experienced a sudden bereavement to complete an online survey measuring post-bereavement suicidal ideation and attempts, and other psychosocial outcomes. Inclusion criteria were: current age 18-40 years, and sudden bereavement of a close contact since the age of 10 years. Multivariable regression was used to compare those bereaved by suicide to two reference categories: those bereaved by natural causes and those bereaved by unnatural causes.

Results: Of 3,432 eligible respondents, 614 adults were bereaved by suicide, 712 by sudden unnatural causes of death, and 2,106 by sudden natural causes. Compared with adults bereaved by natural causes, adults bereaved by suicide had a significantly increased risk of suicide attempts (AOR=1.65; 95% CI=1.12-2.42; p=0.01), drop-out from work or education, and subjective stigma, but a similar risk of suicidal thoughts, poor social functioning, non-suicidal self-harm and incident depression. Compared with adults bereaved by unnatural causes, adults bereaved by suicide had a similar risk of all the above outcomes, except for an increased risk of poor social functioning and subjective stigma. For all the associations identified, risks were elevated in both relatives and non-relatives.

Discussion: My findings suggest that there are some risk similarities in suicidality between young adults exposed to suicide bereavement and those exposed to other violent bereavements.

Implications: The needs of young adults in the UK bereaved by unnatural deaths may also need consideration in suicide prevention policy.

Preface

In this thesis I present the findings of a quantitative study measuring the impact of suicide bereavement on the mental health and social functioning of young adults in the UK. The first chapter outlines how I identified this topic to be a significant gap in the literature on risk factors for suicidal behaviour. The second chapter contains the systematic review I carried out to summarise studies conducted previously, which was published in *The Lancet Psychiatry* in 2014. The third chapter outlines the method used to sample young adults and to collect both quantitative and qualitative data for three exposure groups: those bereaved by suicide, those bereaved by sudden natural causes, and those bereaved by sudden unnatural causes of death. The fourth chapter sets out the results of logistic and linear regression in relation to my primary outcomes (post-bereavement suicidal ideation and suicide attempt), and secondary outcomes (current social functioning; post-bereavement non-suicidal self-harm; post-bereavement depression; post-bereavement drop-out from work or education; post-bereavement non-suicidal self-harm; stigma, shame, responsibility and guilt). In the fifth chapter I explore the implications of these findings, both for clinical practice and policy, consider alterative explanations, and set them in the context of previous research. After discussing the strengths and limitations of my study, I end by describing directions for future research.

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Chapter 1 Introduction

> *"Suicide may appear to be not only a judgement on life itself, but also on others who had been closely associated with the person who chose that form of death"* (Department of Health document, 1994) (1)

The first part of this chapter outlines my reasons for choosing to investigate the impact of suicide bereavement on mental health and social functioning, in relation to the research evidence, current theory, the perspective of the bereaved, and the evolution of suicide prevention strategy. I then explain why I chose to focus specifically on young adults, based on factors such as policy priorities, suicide epidemiology, and public concerns about the possible effects of suicide contagion in young populations. In the third section of this chapter I review the literature on internet-mediated approaches to mental health research, indicating why I chose this method for the collection of quantitative and qualitative data. Finally, I specify the aims and objectives of this research thesis, my hypotheses and research questions, and the outcome measures used in my cross-sectional study of young adults bereaved suddenly.

1.1 Definition of research topic

1.1.1 Research priorities in suicide prevention

Preparatory work for this project aimed to identify gaps in the evidence base for suicide prevention. Analysis of the literature showed that suicide stands apart from other public health problems because suicidal ideas and actions arise from diverse underlying pathologies rather than one distinct diagnosis (2). A tendency to regard suicide uni-dimensionally (3) and to set an unrealistic goal of one blanket intervention for all (2) seemed to have hampered suicide prevention efforts. I identified a need to shift towards describing the epidemiology of suicidal behaviour, otherwise termed suicidality, in specific risk groups (4), particularly those outside mental health services. My rationale was the lack of good evidence for the effectiveness of interventions targeted at psychiatric patients (5) and the observation that the majority of people dying by suicide are not under the care of mental health services (6).

International evidence suggests that whilst 87-91% of suicide decedents are thought to have had a diagnosable mental disorder (7;8) many are not diagnosed or treated. US data suggests that only a third of those who die by suicide had contact with mental health services in the year before dying, whereas three-quarters were seen in primary care during that year (9). In the UK, 70-77% of people who died by suicide in Scotland, England, Northern Ireland and Wales between 2001 and 2011 had not been in contact with mental health services in the year before dying (6). Although an estimated 91% of those in current or recent contact with secondary mental health services had seen their general practitioner (GP) during the final year of their life, only 26% of the GPs surveyed stated that they were concerned for that patient's safety at the last consultation (10). These patterns support the need to identify risk factors for general practice screening purposes.

Putative risk factors in population samples include employment status, susceptibility to media influences, physical illness, social isolation, relationship breakdown, and traumatic bereavement, particularly that by suicide. The last of these has gained currency as a risk factor for suicide attempt since the 1980s when the World Health Organisation (WHO) identified suicide-bereaved relatives as a high risk group (11). Although enshrined in suicide prevention strategy in England since 2002 (12), there has been a striking lack of evidence to support its inclusion, and little research using UK samples. I therefore chose the topic of suicide bereavement for my PhD thesis to address this gap in the evidence base for current UK policy on suicide prevention.

1.1.2 Definition and incidence of suicide bereavement

Suicide bereavement describes the period of grief, mourning and adjustment after a suicide death that is experienced by family members, friends, and any other contacts of the deceased who are affected by the loss. In the USA, individuals affected are described as suicide survivors or suicide loss survivors (13;14), and the interventions delivered after a suicide to support and assist the bereaved are described as postvention programs (15).

Data from US surveys provide estimates that as many as 7% of the adult population are exposed to bereavement by suicide each year (16). The incidence may be higher in adolescent populations, with a Canadian survey finding that 9% of 16-17 year olds

reported the suicide of a schoolmate in the past year, and 24% reported lifetime exposure (17). Social network analysis in the US suggests that a median of 60 people are "intimately and directly affected" by each suicide death, including nuclear and extended family, friends, colleagues, and classmates (18). Given WHO estimates that 800,000 people die by suicide annually (19), between 48 and 500 million people may be exposed to suicide bereavement each year. Given the number of people that might potentially be affected by any adverse effects of suicide bereavement, it is important to be precise about the associated risks, particularly those relating to suicidal behaviour, and the interventions appropriate to mitigate such risks.

1.1.3 Conceptual framework for impact of suicide bereavement

1.1.3.1 Outcomes of all-cause bereavement

Although bereavement is a natural and common human experience, there is some evidence for its adverse physical and mental health consequences (20), including conflicting evidence for an increased risk of all-cause mortality and some evidence for an increased risk of mortality due to violent causes.

1.1.3.1.1 Risk of all-cause mortality

Most studies of mortality following bereavement have focussed on loss of a spouse, with Finnish data showing that mortality rises sharply in the first week after widowhood, particularly from ischaemic heart disease (21). Studies investigating the effects of loss of a child have shown an increased all-cause mortality risk in Swedish mothers after their child's death, particularly after death by unnatural causes (suicide or accident) of a minor (22). However the long-standing popular notion of 'dying from a broken heart' has been challenged more recently by large-scale studies, which have found either no evidence of elevated mortality or statistically weak associations (23).

1.1.3.1.2 Risk of mortality due to violent causes

Evidence from a number of high-income countries shows risk of suicide to be increased after widowhood, including for men and women in Finland (21) and the United States (US), where risk is particularly high in young White men aged 20-34 (24). US data on widows aged over 60 demonstrates an interaction with sex, such that risk of suicide is increased for widowed *versus* married men but is no different

for widowed *versus* married women (25). In Ireland, widowed men and women exhibit an excess risk of mortality due to suicide and accidental deaths compared with age-matched married controls (26). Data from war zones shows that suicide risk in Kosovan war widows is rated as higher than their married counterparts (27). Danish data on young adults losing a parent show an increased risk of suicide after parental suicide or early death compared with no exposure (28). Among Danish widows the first year following widowhood represents the period of greatest suicide risk, with men aged over 80 and women aged 65-79 at highest risk (29). In Swiss samples, risk of suicide in widowed persons is particularly high in the first few months after bereavement (30).

1.1.3.1.3 Bereavement as a putative risk factor for suicide

Latent class analysis of a range of known suicide-related risk factors shows that recent death of a friend or family member contributes less to suicide risk than life stressors such as interpersonal problems or criminal legal problems (31). A major review of the literature on risk factors for suicide and suicidal behaviour identified bereavement as a key gap in the review-level evidence for suicide risk, except as an additive risk factor in the context of bipolar disorder and schizophrenia (32).

The experience of bereavement varies greatly according to the circumstances of the death, the degree to which it was expected and the opportunities for anticipatory grief. Recent US household survey data show that the unexpected death of a loved one was cited as respondents' most common traumatic experience, and was also most likely to be rated as their worst traumatic experience (33). The same study demonstrated an association between unexpected bereavement and a range of psychiatric disorders across the life course (33). Analysis of UK primary care databases shows that sudden bereavements carry a higher mortality risk for surviving partners than expected bereavements among older couples in the UK (34). Not all individuals will be adversely affected, and risk of poor outcomes is likely to be governed by factors such as personal vulnerability, kinship (35), age (36), and the quality of attachment. Studies using heterogeneous samples of bereaved individuals are liable to type II error in obscuring true relationships, and there is a need for further work comparing the effects of differing modes of bereavement, to determine whether specific bereavements are a risk factor for suicidal behaviour.

1.1.3.1.4 Diagnostic changes

The involvement of doctors in managing grief is a relatively recent phenomenon. The diagnostic classification systems ICD-10 (International Classification of Diseases 10th revision) and DSM-IV (Diagnostic and Statistical Manual of Mental Disorders 4th edition) understood grief as a normal response to bereavement, requiring depressive symptoms after such a loss to exceed two months and include severe symptoms if to be diagnosed as depression (37;38). This bereavement exclusion was subsequently challenged on the basis of clinical comparisons between cases of bereavement-related depression and depression related to other stressful life events, in which similarities outweighed differences (39). With the publication of DSM-5 this 2 month rule was reduced to 2 weeks (40), despite objections that this was based on insufficient data (41) and risked medicating patients unnecessarily (42).

The other change to DSM-5 was the introduction of a new diagnosis of adjustment disorder related to bereavement. This responded to an accumulation of literature describing the concept of complicated or prolonged grief disorder (PGD), and proposing diagnostic criteria reported to have sufficient psychometric validity for introducing a new diagnosis of PGD (43). Others have challenged the validity of these criteria (44). The balance to be achieved in this debate is that between providing specific evidence-based treatment for depression and in medical intrusion on personal emotions (45), together with the risk of stigmatising individuals through psychiatric diagnosis (46). Ultimately it is too early to say whether clinicians will be prepared to adhere to the new diagnostic classification.

1.1.3.2 Factors specific to suicide bereavement

1.1.3.2.1 Clinical concerns

Suggestions that suicide bereavement has more damaging psychological and social impacts than other types of bereavement have been voiced since the 1960s (47;48), based on clinical concerns (48;49), and backed up by influential personal accounts (50;51). Explanations include the particular psychological trauma of a suicide loss (13), involving grief plus agonising self-questioning (1), as well as the cultural taboo around death, but particularly suicide deaths (52).

1.1.3.2.2 Proposed familial and environmental contributions

Factors that are thought to elevate the risk of suicidality and other adverse outcomes in the suicide-bereaved can be regarded as either familial or environmental, but are difficult to separate out and remain largely theoretical (see Figure 1-1: Suggested familial and environmental contributions to suicide risk in relation to suicide bereavement). A family history of suicide is an established risk factor for suicide (53) (54), and liability to suicide attempt appears to be transmitted independently of psychiatric disorder (55;56). After parental suicide, odds of offspring suicide increase with younger age of death of parent (57), suggesting genetic variants or environmental contributions beyond familial risk. Further familial contributions arise from shared familial environments and genetic risk for suicidal behaviour, mental illness and aggression (58-60). Theories of assortative mating (in the case of partners) (60) and assortative relating (61) (in the case of friends) also explain shared traits for suicidality, mental illness and aggression among non-relatives of the deceased, who are also subject to shared environmental exposures (occupational, domestic, and recreational).

Factors relevant to both relatives and non-relatives of the deceased include social modelling (62), suicide contagion (63;64), the stigma of suicide (65;66) (67), caregiver burden, particularly the strain of being on 'suicide watch' (68-70) (71), and the putative effects of exposure to suicide bereavement. These factors are additional to the consequences of any loss, which are implicated in the increased risk of all-cause mortality after bereavement *per se:* psychological distress; loneliness (72), alcohol use; loss of a confidant(e); as well as changes in social ties, living arrangements, eating habits and economic support (20). If suicide bereavement is a risk factor for suicidality, its effect is likely to be intertwined with many of these other components.

Figure 1-1: Suggested familial and environmental contributions to suicide risk in relation to suicide bereavement

<table>
<tr><td>Relatives</td><td>Genetic risk (direct inheritance)</td><td>Shared familial environment</td><td rowspan="2">Other environmental risk (e.g. carer burden)</td><td rowspan="2">Effects of any bereavement (e.g. grief, loneliness; alcohol use; loss of a confidante; economic changes)</td><td>Specific effects of suicide bereavement?</td></tr>
<tr><td>Non-relatives</td><td>Assortative mating

Assortative relating</td><td>Shared domestic, occupational, or recreational environment</td><td>Specific effects of suicide bereavement?</td></tr>
</table>

1.1.3.2.3 Cultural context

A taboo refers to something prohibited by custom, and in the context of death results in a tendency to avoid discussing the death or to keep mourning hidden. From the Middle Ages, legal, religious, and social sanctions against suicide, particularly in Roman Catholic, Jewish and Islamic communities (73), were intended as a deterrent but created an additional burden for people mourning a suicide (67). In the 18th century punishment gave way to a strong cultural taboo against suicide, and a tendency to deny the cause (67). In 1897 the French sociologist Durkheim argued that suicide rates were explained by societal phenomena, such as anomie (normlessness) and egoism (poor social integration), rather than the specific actions of individuals (74). These ideas shifted the focus from individual-level risk factors for suicide towards group-level factors, and although popular at the time, Durkheim's theory has been criticised for neglecting psychological variables (74).

Over recent decades societal attitudes have shifted towards greater tolerance of suicide, viewing it as a rational act (52;75;76), particularly among young people (77).

There appears to be a growing acceptance of suicide among the young as a means of expressing despair (76), perhaps fuelled by the debate over assisted suicide (52). An association has been observed between the perceived acceptability of suicide among young people and their risk of suicide attempt (78). Whilst research findings regarding heritability of suicide (54) may have served to reinforce the stigma of suicide, findings in relation to other risk factors have increased society's appreciation of the myriad physical, psychological, and social influences on an individual's decision to end their life (79). In spite of this, a number of structural factors in society perpetuate the stigma associated with suicide, including the tendency of life insurance companies to refuse policies for people with a family history of suicide, and delays in awarding an insurance pay-out to families bereaved by suicide.

In British culture, whilst there remains an embarrassment about discussing death, and a social awkwardness in responding to the bereaved, there is also a fascination with death (80). It is easy to see how communication with the bereaved after a violent death might easily be misinterpreted as reflecting curiosity rather than compassion. Adding to these difficulties in social communication are the societal expectations that the bereaved should contain their feelings, 'let go' of the dead, and restore themselves quickly to normality (81;82). This cultural context provides one explanation for why people bereaved by suicide are thought to experience greater stigma than other bereaved groups, as discussed next.

1.1.3.2.4 Stigma

Stigma is the term used to describe mistrust, fear, negative bias, and stereotyping of the stigmatized individual or group, as well as embarrassment and/or avoidance (67). A number of reviews have suggested that people bereaved by suicide experience greater stigma than those bereaved after other mortality causes (65-67), adding to their sense of isolation. Explanations for hurtful or stigmatising attitudes include societal beliefs that suicide is shameful or horrifying; that it indicates inherited weakness or flaws in those associated with the deceased; that it reflects a failure of family and friends (83); or that it is contagious (84). Even those with the best intentions may avoid the bereaved due to their own embarrassment or a fear of appearing socially incompetent (13).

Qualitative research with people being treated for mental illness suggests that two forms of stigma exist: self-stigma or a subjective sense of being stigmatised (even in the absence of any discrimination), and overt discrimination (85). The consequences of each include anger, depression, fear, anxiety, feelings of isolation, guilt, embarrassment and a reluctance to seek help. Stigmatising attitudes may be manifested both within and outside a bereaved person's social network. US survey data show that parents bereaved by a child's suicide reported hurtful responses from family, friends, colleagues, neighbours and family members, with the highest proportions from ex-spouses (44%), in-laws (31.8%) and their own parents (28.4%) (82).

Studies of the reactions of non-bereaved individuals towards people bereaved by a variety of causes give further insights into the stigma associated with suicide bereavement (86). Most of this research has been conducted in the US, identifying blaming attitudes and embarrassment in relation to suicide. Non-bereaved subjects are more likely to ascribe blame to a person bereaved by suicide than by accidental death, homicide, or natural death (83). The non-bereaved perceive a greater number of social rules governing interaction with the suicide-bereaved, and the fear of violating any of these many rules results in a tendency to avoid the suicide-bereaved (87). Avoidance on these terms might be explained by embarrassment, through a fear of saying or doing the wrong thing.

1.1.3.2.5 Support after a suicide

The explanations for why suicide bereavement might be particularly stigmatised, namely blame, horror, fear, shame, and embarrassment, would also predict reductions in the emotional and practical support available to the suicide-bereaved. Researchers have attempted to measure whether those exposed to suicide differ from other bereaved groups in the quality or quantity of support received after death. As described below, there are inconclusive findings from studies comparing bereaved people's accounts of the help they received after the death with the accounts of members of their support network regarding the help they offered after the death (13). This is likely to be due to difficulties capturing the relevant dimensions of support.

In a Canadian sample there were no differences between parents bereaved by a son's suicide and by a son's motor vehicle crash in the number of people providing support, but the suicide-bereaved group were significantly more likely to describe this support as unhelpful (88). The suicide-bereaved group were also significantly more likely to gain support beyond the family, suggesting that they could rely less on relatives for support (88). A US study compared suicide-bereaved adults' reports of support received to the accounts of members of their social circle who had provided that support. This found no significant differences between their ratings, although the validity of these measures was questionable (89). In another US sample, a high proportion of non-bereaved people anticipated they would respond helpfully to someone bereaved by suicide, accident, homicide, sudden natural death, or expected natural death, while their bereaved peers (representing all those groups) reported having received a correspondingly lower level of helpful support (90). Those bereaved by suicide were most likely to recall unhelpful support (90). However, the unstandardised measures used in their study were highly subjective, and may have over-estimated offers of support and under-estimated receipt of support, particularly given that the non-bereaved group reported hypothetical rather than past behaviour.

Measurement of support is clearly problematic because of the lack of standardised measures of objective and subjective levels of support, as well as the role of recall bias. Additionally, although objective measures would seem to be preferable, the bereaved may value subjective measures (for example, the perception that others are available) more than objective measures (for example, the number of friends in their network) (91). Input from the consultation group advising on the study forming the basis of this thesis suggested that help from any source can be perceived as helpful one day, and unhelpful the next, according to the situation and the fluctuations in psychological state of both parties. Close family can be perceived as almost tyrannical in insisting the bereaved person seek professional help without understanding just how unwelcome that help might be. This idea that inappropriate help, or help that is pressed too vigorously, may be as distressing as providing none at all, has been reported elsewhere by relatives bereaved by suicide (1). Many of the consultation group also described pressure to 'move on' with their grief, consistent with evidence from the US (82;89). Among those bereaved by suicide, suicide support groups were not always tolerated because of difficulties confronting others'

continued suffering. This contrasts with US qualitative data showing that suicide-bereaved subjects felt that only other suicide survivors could help them (89).

1.1.3.2.6 Suicide contagion

Suicide contagion is a factor relevant to both relatives and non-relatives of those dying by suicide, and is explained by the social modelling of suicidal behaviour (62). Such imitative effects are thought to operate both through the influence of the media (63) and through direct contact, as seen in a number of US suicide clusters (64;92). In addition to social modelling, the theoretical framework for suicide contagion includes a desire to join the deceased; exposure to suicide increasing its acceptability as a response to perceived entrapment; direct contact with peers; and the influence of sensationalist media portrayals of suicide, particularly in the 15-19 year age group (63). Young people are known to be particularly susceptible to suicide contagion (64), and this may be due to heightened suggestibility, a sense of romanticism, or strong identification with their own age group. Indeed Samaritans have produced guidelines on the media reporting of suicide (93), emphasising the dangers of romanticisation, as well as related issues of glamorisation and sensationalism. These guidelines are founded on the evidence that such factors influence imitative suicidal behaviour (94).

Psychological autopsy data from Sweden indicates that of 58 consecutive suicides by young people aged 15-29 in 1984-1987, 43% had experienced the suicide of a friend (95). Swedish data also show that men exposed to the suicide of a family member or of a work colleague (in workplaces of fewer than 100 employees) had a risk of suicide 8.3 times and 3.5 times higher (respectively) than unexposed men (96). The data on network size indicated that workplace exposure to suicide was of potentially greater public health importance than family exposure because it exposed more people: a mean of 15.3 versus 2.9 (96). A US survey of social networks suggested that of the median of 60 people intimately affected by each suicide death, 20 were family, 20 were friends, and 20 were colleagues and classmates (18). Given the extent of exposure to bereavement by the suicide of a non-relative it is important to quantify any risk of suicidality associated with this exposure compared with other modes of bereavement.

1.1.3.2.7 Self-fulfilling prophecy

Public awareness that a family history of suicide increases the chances of a similar fate (53;54) risks giving rise to a self-fulfilling prophecy; the mistaken belief that a suicide death is inevitable serves to create that reality. Sensationalist or careless media reporting adds to the distress and isolation of the bereaved (97) (98), and may also propagate the idea of a self-fulfilling prophecy or of the heroism of a suicidal act. Media guidelines on the reporting of suicide emphasise the need to protect the feelings of the bereaved, and avoid sensationalism (93), so as to limit potential imitative suicides (94).

The integrated motivational-volitional (IMV) model of self-harm/suicidal behaviour is a bio-psycho-social framework for understanding how suicidal ideation translates into suicidal behaviour through three phases: pre-motivational, motivational, and volitional (99). It is also useful for understanding how the concepts of suicide contagion and self-fulfilling prophecy in the context of suicide bereavement might influence suicidal behaviour. The pre-motivational phase of the IMV model describes the context of personal vulnerabilities and environmental risk factors, in which negative life events might occur. Suicidal ideation is triggered in the motivational phase if influenced by cognitive biases, engendering a sense of entrapment. The effect of motivational moderators, such as an individual's attitudes to suicide, may precipitate suicidal intent in an individual feeling defeated and entrapped. Finally, in the volitional phase, volitional moderators, which include impulsivity, access to means, and imitation, influence whether a suicidal person attempts suicide (99). Relating this model to suicide bereavement, an individual's attitudes to suicide (motivational moderator) might include beliefs about self-fulfilling prophecies, and exposure to the suicide of a close friend or relative (volitional moderator) might increase the risk of imitation.

1.1.3.2.8 Research comparing suicide bereavement with other modes of bereavement

In 2008, at the time of designing this study, the first systematic review of controlled studies measuring the impact of suicide bereavement was published, covering publications up to January 2005 (66). This used a rigorous search strategy and inclusion criteria, but restricted outcomes to subjective measures, thus omitting three

key European registry-based studies measuring suicide mortality (60;100;101). Most of the 41 studies it identified had methodological shortcomings, including use of convenience samples, small sample sizes, unstandardised measures, and unadjusted analyses. Data from these studies showed no significant differences between people bereaved by suicide and those bereaved by other causes on measures of general mental health, depression, post-traumatic stress disorder (PTSD) symptoms, anxiety and suicidal ideation. The review did, however, show an excess of overall grief distress among the suicide-bereaved, as well as of specific components of grief, such as stigma, shame, blame, rejection, and concealment of the cause of death. The authors concluded that further descriptive studies were required, using unbiased sampling methods, adequately-powered sample sizes, standardised measures, and appropriately adjusted statistical analyses.

On commencement of the PhD project in 2009 an updated search revealed that few additional studies had been published since, and a decision was made to repeat the search in the last year of the PhD. This review is presented in Chapter 2, covering publications up to October 2013, and has been published in *The Lancet Psychiatry* (102) (see Appendix 3). This review did not include studies investigating the impact of patient suicide on mental health professionals, because these studies have used non-bereaved controls (103;104). However available evidence suggests a profound effect on their emotional health (103;104) and professional practice (103;105). My review also did not include qualitative studies, which are argued to be a more sensitive means of identifying thematic differences between those bereaved by suicide and those bereaved by other modes of death (106).

In summary my review found several negative outcomes specific to suicide bereavement, including an increased risk of suicide in partners bereaved by suicide; of suicide in mothers bereaved by an adult child's suicide; of admission to psychiatric care in parents bereaved by offspring suicide; and of depression in offspring bereaved by maternal suicide. It found no studies investigating peer suicide using bereaved controls. Suicide-bereaved individuals across a range of kinships had higher scores on dimensions such as stigma, responsibility, shame, and rejection compared with bereavement by natural and unnatural causes. The review identified many similarities between outcomes in people bereaved by suicide and those

bereaved by sudden violent death in relation to grief intensity, stress reactions, and psychopathology.

1.1.3.2.9 Protective effects

Positive outcomes have also been documented after suicide bereavement, but these tend to be found in qualitative rather than quantitative research. Inductive bias may be one explanation for this, if quantitative researchers have a tendency to neglect outcomes such as carer burden.

Protective effects appear to be mediated by attitudes to the effects of suicide bereavement, and by carer burden. For example interviews with young suicidal men in Northern Ireland found that those exposed to the suicide of a peer observed the devastating aftermath and understood suicide as something to avoid (107). US adolescent peers reported informally to researchers that their friend's suicide had inhibited their own suicidal behaviour because of the perceived devastating effects on friends and family (108). Personal accounts of the bereaved describe relief that a person's psychological suffering had ended, or that the difficulties of a troubled relationship had diminished or disappeared (50). Qualitative interviews confirm such reports of relief in suicide-bereaved adults (68;69).

Evidence derived from quantitative studies provides estimates of the prevalence of those on 'suicide-watch': 44% of parents in a Swedish sample had worried their child might die by suicide in the month before their suicide (70), and 79% of suicide decedents in a US sample had made their relatives and friends aware of their intentions (68;69). A quantitative survey of parents bereaved by a son's suicide or motor vehicle crash found that a third of each group reported positive outcomes for family adjustment after the death, although a significantly greater proportion of the suicide-bereaved group reported negative outcomes (88). In US samples, parents bereaved by a child's suicide reported relationships with friends and relatives to have variously improved and deteriorated (82), whilst 86% of family members perceived that the suicide had drawn the family together (109).

1.1.3.2.10 Theoretical framework

The factors discussed above support two conflicting theses, with suicide bereavement conferring positive and negative psychosocial health outcomes respectively. Specifically in relation to suicidality, two possible associations with suicide bereavement are possible:

- a positive correlation, explained by depression, stigma, self-fulfilling prophecy, a heightened sense of mortality, suicide contagion, or other factors
- a negative correlation, explained by relief, a reduction in family disruption, a cessation of being on 'suicide watch', carer burden, or other factors.

Various explanatory pathways are possible in each case, as applied to suicidality and other outcomes, and are outlined below.

1.1.3.2.10.1 Negative outcomes

- If a young adult experiences stigmatising attitudes following a suicide, there may be a tendency for other people to avoid them after the death and fail to offer the appropriate help, as well as reduced willingness on the part of the young bereaved adults to seek help. These factors might engender a sense of isolation, and increase the risk of depression, whilst reducing help-seeking for depression, thereby increasing the risk of suicidal behaviour.
- The stigma of suicide might cause a bereaved person to conceal or lie about the cause of death or hide their grief, leaving their network unaware of their need for support. Isolation, depression, and suicidality might arise as above.
- If a suicide is perceived as heroic by a peer group, particularly in the context of media attention and specific personality traits, this may increase the risk of suicidal behaviour even in the absence of any psychiatric illness.
- Where a suicide in the family might have been perceived as having reduced the carer burden, other depressed members of the family might see suicide as a self-fulfilling prophecy, particularly if they also perceive themselves to be a burden.

1.1.3.2.10.2 Positive outcomes

- If a suicide-bereaved person observes great distress in the circle of bereaved family and friends, then the risk of suicidal behaviour might be reduced to avoid the anticipated punishment to others, even in the context of suicidal ideation.
- Grief following suicide bereavement could involve a profound sense of anger over a life wasted, resulting in a resolve to live life to the full, and so reducing suicide risk.
- The suicide of a chronically troubled person might bring about an end to disruption within a family or social circle, and some resolution of the problems inherent in caring for them, resulting in improved mental health and social functioning for members of that network.

1.2 Policy background

Increasing policy attention has been dedicated to suicide bereavement over the last decade, and suicide prevention strategies in a number of high-income countries (110;111), including the US (111), Canada (112), England (110), Wales (113), Scotland (114), Northern Ireland (115), Ireland (116), Australia (117), and New Zealand (118), recommend support for people bereaved by suicide. The implication is that such support might reduce risk of suicide attempts, but these policies cite little evidence to describe the nature or magnitude of the effects of suicide bereavement and are vague about how extensively to offer support within the deceased's family and social circle. The repertoire of evidence-based interventions is also very restricted (15;119;120). It is striking that suicide bereavement came to receive such policy prominence in the absence of clear supporting evidence, but the case studies provided by England and by the United States demonstrate the powerful role of the voluntary sector in drawing attention to clinical concerns and setting the policy agenda (121). Following a discussion of the evolution of suicide prevention strategy in each country, I explore how realistic current recommendations are in relation to their financial sustainability and the research needed to identify other groups for inclusion.

1.2.1 England

The first suicide prevention strategy in England, which was published in 2002 (12), including a recommendation to promote the mental wellbeing of people bereaved by suicide. They were defined as a vulnerable group "about whom concerns were expressed during the consultation period", but not a high-risk group because of the lack of supporting statistics. The support offered by voluntary organisations The Compassionate Friends, Cruse Bereavement Care, Survivors of Bereavement by Suicide, and PAPYRUS was recommended. A pledge was also made to improve support for bereaved people involved in the inquest process, although without the necessary resources (122). No literature was cited to support the inclusion of the suicide-bereaved as a vulnerable group, but organisations such as Cruse Bereavement Care, Survivors of Bereavement by Suicide, PAPYRUS, and the Coroners' Society of England & Wales had formed part of the consultation group.

The concerns raised at that time were based on clinical experience and demand for services, as well as on a limited research literature dating back to the 1970s (84;123-126), largely criticised for its methodological approaches (127), and with no literature reviews having yet taken a systematic approach (47;49;84;128;129). This body of literature seemed to indicate few differences between suicide bereavement and that by other causes, but also a need for more rigorous research studies. More widely, the Royal College of Psychiatrists and the International Association for Suicide Prevention (IASP) had also highlighted the need for providing support to those bereaved by suicide (130).

In the decade between the publication of this first suicide prevention strategy (12) and its revision (110) little additional evidence was published to support the clinical suggestion that people bereaved by suicide had worse psychosocial outcomes than other bereaved groups. Two British studies described the difficulties encountered by the suicide-bereaved during the inquest process, particularly in relation to media reporting (131) (132). Editorials highlighted the particular stigma, shame and guilt associated with a suicide death, and how this might complicate the mourning process (130), and acknowledged the limited evidence base for interventions (133). NICE guidelines addressed bereavement only in the context of end-of-life care, with generic Department of Health guidelines on bereavement services suggesting the

development of local pathways for sudden and traumatic deaths (134), but without giving further detail.

The first systematic review of controlled studies measuring the impact of suicide bereavement was published in 2008 (6 years after the first suicide prevention strategy) covering publications up to January 2005 (66). This is summarised above (see 1.1.3.2.8), and found no significant differences between people bereaved by suicide and those bereaved by other causes on measures of general mental health, depression, PTSD symptoms, anxiety and suicidal ideation. The first systematic review of interventional studies for the suicide-bereaved was published the same year, including trials published up to October 2007 (119). It identified only 8 studies, and provided weak evidence for the effectiveness of a nurse-led cognitive–behavioural family intervention, a psychologist-led bereavement group for children, and group therapy for adults delivered by a mental health professional.

Despite these limited advances in the evidence base, the 2012 suicide prevention strategy for England gave markedly greater prominence to the needs of those bereaved by suicide (110). Although they were defined neither as a high-risk group nor a vulnerable group, the provision of support for people bereaved or affected by suicide was one of the six Areas for Action (Area for Action 4: *Provide better information and support to those bereaved by suicide or affected by suicide*), and one of two Overall Objectives. The literature cited to support these recommendations was restricted to a Danish registry-based study in which exposure was to a family history of suicide rather than to suicide bereavement (56), a New Zealand review of interventions not publically available (135), an exploratory study measuring the impact of suicide bereavement on first degree relatives and spouses that was not adjusted for pre-bereavement baselines (136), and interventional studies previously summarised in the sole systematic review of treatments (119;137). The only systematic review comparing psychiatric outcomes after suicide bereavement and after bereavement by other causes, showing few differences (66), was not cited. No specific kinships were identified as highest risk, despite clear evidence published by this date that partners (60) and mothers bereaved by suicide (100) were two groups identified as being at higher risk of suicide than controls bereaved by other causes.

The revised strategy's recommendations for support included specialist bereavement counselling and support (recognising the limited evidence for this); the voluntary organisations Samaritans, Winston's Wish, Cruse Bereavement Care, Survivors of Bereavement by Suicide, and The Compassionate Friends; and the need for general practitioners to be "vigilant to the potential vulnerability of family members" after a suicide, without specifying a need for screening. Also listed were the information resources provided by the DH (138) and the voluntary organisations INQUEST, Healthtalkonline, Mental Health Matters, and If U Care Share. Little work has been done to assess the needs of those bereaved by suicide and other unnatural causes. The only national survey of bereaved relatives in England focussed on the quality of end-of-life care, excluding those bereaved by accidents, suicides and homicides, which accounted for about 2.4% of all deaths in the study period (139). Overall there is a sense of a lack of clarity over how to address the expressed need for care from those bereaved by suicide, and a tendency to rely heavily on the voluntary sector without a guarantee of financial support.

1.2.2 United States

Policy developments in the US have followed a parallel course. People bereaved by suicide are to be credited with providing the momentum behind publication of the first suicide prevention strategy in the US in 2001 (140). This document mentioned people bereaved by suicide as a group in need of support and recommended the development of guidelines on appropriate services. In the ensuing years the growth of community programs continued, including individual counselling, online support and regular awareness events, largely run by the voluntary sector and not centrally-coordinated.

Concurrently with England, a revised strategy was published in 2012 (111). This listed people bereaved by suicide among 11 high-risk groups for suicidal behaviour, alongside people who had self-harmed, people who had attempted suicide, older men, and middle-aged men. The document stated that "exposure to a suicide attempt or death, particularly of someone who is psychologically close, can have harmful effects on individuals and families, including increasing the risk for suicide in the person exposed". This point was supported not by the only systematic review published at that point (66), but by a book providing a thorough, but not systematic,

review of the quantitative and qualitative evidence published to that date (141). This book had included a summary of the 2008 systematic review, and its finding of no differences on measures of mental health or suicidal ideation, acknowledging the generally weak and tentative evidence that suicide bereavement was associated with worse outcomes than other bereavements (141). Much of this evidence had used non-bereaved controls, leaving it unclear as to whether any increased risk of suicidality was due to suicide bereavement or to bereavement *per se*.

The 2012 strategy made reference to interventions judged to be acceptable (142) but not to any effectiveness data. Support recommended in the strategy included outreach teams, face-to-face and online support groups, memorial services, and professional input for trauma treatment and care for complicated grief. One specific recommendation was that mental health services offered to employees should include grief counselling for individuals bereaved by suicide. The need for evaluations of the effectiveness of these interventions was also acknowledged, together with the unresolved need to develop national guidelines for support.

1.2.3 Future policy-making

These international case studies demonstrate not only the complex relationship between research evidence and policy-making, but the insider status afforded to the voluntary sector by policy-makers (121). Whilst the support needs of those bereaved by suicide are not in any doubt, it is interesting to observe how their needs have been prioritised above those of other groups generating clinical concerns. Theories of power structures in policy-making (143) would indicate that the three criteria necessary for an issue to become a policy priority had been satisfied: the *legitimacy* of public health policy interventions, the *feasibility* of intervening, and public *support* for governmental intervention. The problem this has introduced is that the recommendations for support in both policies rely heavily on provision by the voluntary sector, but without adequate funding for such organisations the sustainability and feasibility of intervening is threatened.

Given my systematic review's finding of many similarities between people bereaved by suicide and by other violent deaths (102), and indeed of a study showing worse depressive outcomes in the latter group (71), it will be important for policy-makers to

review whether future suicide prevention strategies should also recommend the provision of support to people bereaved by non-suicide violent deaths. This will rely on evidence from studies comparing outcomes in those bereaved by suicide with those bereaved by other sudden causes of death.

1.3 Choice of sampling frame for cross-sectional study

Having decided to investigate suicide bereavement as a putative risk factor for suicidality, I wished to define the socio-demographic characteristics of the population in which to test for an association. A focus on delineating risk factors for suicide in specific age-groups has been encouraged as a means of informing the development of any subsequent tailored treatment approaches and prevention strategies (144). For example, a study that found an association between suicide bereavement and risk of suicide attempt in a sample of UK adults aged >18 might use additional qualitative data to develop a psychosocial intervention for reducing such a risk. The resulting blanket intervention would be unlikely to have universal positive outcomes if it had differential effectiveness and/or acceptability in different age-groups (2). In the following section I describe the factors influencing my decision to focus my study on young men and women bereaved suddenly by any close contact. This included a review of suicide epidemiology; the high-risk status of young men in UK suicide prevention policy at that time (12); the relative paucity of research on individual risk factors for suicide in this age group; concerns over vertical (intergenerational) and horizontal (peer-to-peer) social modelling effects; and the high economic cost to the nation of suicide in this group (145).

1.3.1 Epidemiology of suicide in different age-groups

At the time of planning this research project in 2007, the groups identified by the 2002 national suicide prevention policy as highest risk for suicide were people under the care of mental health services, people who had self-harmed, young men, prisoners, and those in high-risk occupational groups (12). The inclusion of young men reflected falls in suicide rates among older men, traditionally understood to be the group at highest risk, coupled with rises in rates for young men (146) who had supplanted older men as highest risk (147). This identified young adults as a potential sub-group of interest.

To better understand the risk factors for suicide in young men, I conducted a systematic review of international studies describing the epidemiology of suicide in men aged 19-30, which was published in *The Lancet* (145) (see Appendix 4). This review found that suicide ranks second only to accidental death as a cause of mortality in young men internationally, accounting for a substantial proportion of the economic costs of suicide. Individual-level risk factors for suicide identified in young men included psychiatric illness, substance misuse, lower socio-economic status, and single status. Population-level risk factors included unemployment levels, social deprivation levels, and irresponsible media reporting of suicide. I found very few studies assessing the effectiveness of interventions to reduce suicide risk in young men, but the most promising appeared to be efforts to encourage help-seeking behaviour and to limit access to frequently-used methods. My other finding was that in some parts of the world, young women and middle-aged men were also groups at high risk of suicide (145).

Since planning my research study, epidemiological findings regarding suicide have changed, with a fall in rates for young men (148) and a rise in those for men aged 35-49, who have now become the group at highest risk (149) (150). By 2011, adult men under 50 accounted for approximately half of all suicides in England and Wales (151). This changing demographic was reflected in the shifted focus of the 2012 suicide prevention strategy for England (110); from young men to young and middle-aged men up to the age of 50. Although interpretation of more recent trends in suicide rates are problematic due to the growing popularity of narrative verdicts by coroners (152), these shifts are suggestive of a cohort effect (153). Contributions from the sociological literature describe social factors such as relationship breakdown or job loss as likely contributors to the risk of suicide in middle-aged men (154), as well as the differential impact of the economic downturn on traditionally male industries (155). The difficulties of engaging young (156) and middle-aged suicidal men with services (157) may also contribute to their risk of suicidal behaviour.

1.3.2 Impact of peer suicide

Whilst planning this research project, a series of young people died by suicide in Bridgend, South Wales throughout 2007 and 2008. This was later demonstrated to

have been a suicide cluster, albeit more circumscribed than that reported in the media (158). Press reports on Bridgend indicated that many of the deceased had been known to each other, either personally or through social networking sites, suggesting the role of suicide contagion (63). The irresponsible style of media reporting was condemned by politicians and academics (159), further justifying the existence of media guidelines (93).

Public concern over the deaths in Bridgend highlighted the psychological vulnerabilities of young bereaved adults, and raised questions about the influences of social networking and internet sites (160) on social modelling of a friend's suicidal behaviour. Accidental deaths and suicide are the leading causes of death in young adults (161), therefore peer losses are primarily violent. Young people may lack the emotional resources to deal with grief, and family members may not understand how strong the bond with the deceased had been. Adolescents and young adults who perceive intergenerational misunderstanding or feel alienated from family may be particularly vulnerable to the effects of loss after peer death if bonds with friends were stronger than those with family. The events in Bridgend reinforced the importance of measuring the effect of suicide bereavement on family members and close friends of the deceased.

Few studies have investigated how kinship or quality of attachment moderates the impact of suicide bereavement, and these have tended to focus on family and in-laws rather than friends. Findings have shown either few differences (162) or worse outcomes in first- than second-degree relatives (163). Amongst closest relatives, worst outcomes have been observed in spouses compared with children or siblings (164). In US survey data on the impact of adolescent suicide on friends and acquaintances, there is mixed evidence that closeness predicts worse outcomes, depending on the outcome considered: highest levels of grief were seen in close friends of the deceased (165), while acquaintances were most vulnerable to suicide contagion (108). A high degree of closeness did predict increased risk of PTSD (166) and incident depression (167). Together these factors highlight a need for further research on the public health impact of suicide bereavement in the young; not only among relatives but also among friends of varying degrees of closeness.

1.3.3 Perspective of the bereaved

In planning this study I consulted with members of the public who had experienced a sudden bereavement, bereavement counsellors, voluntary sector organisations representing bereaved people, and clinicians with a special interest in bereavement. It was clear that there was strong support for a study that might be able to clarify the specific impacts of sudden bereavement on both family and friends, and to document views on unmet needs in this population. One point emphasised was that the recovery period is often longer than clinicians and the public might appreciate (91). This informed a decision to include exposure to bereavements occurring years previously, but to include a measure of time elapsed.

1.4 Use of internet-mediated research

Given the traditional tendency for a female gender bias in bereavement (168) and psychosocial health surveys (169), I was keen to choose a sampling method that would minimise male non-response bias. I conducted a literature review on survey methodologies, summarised below, and on this basis chose an internet-mediated design for my cross-sectional study. This section explores the strengths and weaknesses that influenced my choice, particularly in relation to factors such as response, disclosure, bias, and ethics.

1.4.1 Definition of internet-mediated research

Internet-mediated research (IMR) describes the practice of gathering research data via the internet directly from research subjects. Traditionally, cross-sectional survey strategies have involved door-to-door interviews, telephone interviews, postal questionnaires, or consumer satisfaction surveys linked to service use (for example clinic attenders). Newer approaches include text message and email polls. IMR can be applied to cross-sectional internet surveys, observational studies, interventional studies, and online focus groups, in which research subjects respond to a questionnaire or task at a time and place of their choice using the internet. IMR applies both to the means of inviting people to participate in research (by advertising a survey on the internet or emailing specific invitees) and the means of collecting data (using emailed or online responses). The distinction between closed and open surveys is critical. An open survey usually involves a web advert, to which anyone

might respond, in which case it is difficult to estimate the sampling frame or its representativeness. A closed internet survey is by invitation only, so that the denominator is known, allowing measurement of response rate and non-response bias. Closed surveys are therefore preferred, although technical barriers must be introduced to confine responses to invitees only. It is also important to gather information about participant demographics in order to assess the nature of the sample obtained and the generalisability of results (169).

1.4.2 Comparison of IMR with traditional methods

Many of the potential problems associated with using postal questionnaires can be overcome by using IMR. It cuts out postal and printing costs, transcription and data entry costs, and reduces the data-gathering phase and the time taken to process individual paperwork. The paper-free approach may also be more environmentally-responsible, although computer manufacture and use do result in carbon emissions. However, just as recipients of postal questionnaires might become immune to junk mail, recipients of email invitations might also develop email-fatigue. IMR is particularly suitable for sensitive topics, where the anonymity enhances disclosure when compared with interview methods (170). A qualitative study of health behaviour changes in patients affected by colon cancer compared findings from face-to-face versus online chat focus groups, finding that similar themes emerged from both groups but that the anonymity of the internet provided a more comfortable forum for discussing such personal issues (171).

1.4.3 Optimising response to IMR surveys

Research on the factors enhancing response to research surveys concerns mainly postal questionnaires, but many factors apply to IMR surveys too. A systematic review of studies investigating response rates to postal questionnaires evaluated 75 strategies in 292 randomised trials, with its main outcome being the proportion of completed or partially-completed questionnaires returned (172). Factors favouring the probability of responding included: monetary incentives, short questionnaires, personalised questionnaires and letters, making follow-up contact, greater salience of research topic, questions not of a sensitive nature, and the questionnaire originating from universities (172). Qualitative work with student samples confirms that

willingness to complete web- or paper-based questionnaires is influenced by the relevance of the topic to their life experience (173).

A study investigating incentive structures in internet surveys used a factorial design to send a web-based, self-administered survey to 2,152 owners of personal websites (174). Combinations of high *versus* low topic salience, short *versus* long survey, lottery incentive *versus* no incentive, and general feedback (study results) *versus* personal feedback (individual profile of results) showed higher response rates for highly salient and shorter surveys. There was evidence for an interaction between factors. Offering personalized feedback compensated for the negative effects of low topic salience, and a lottery incentive tended to evoke more responses only if the survey was short (although this was of marginal significance).

1.4.4 Minimising missing data in IMR surveys

Internet-based surveys can present questions in a single scrolling page (for short polls) or a series of linked pages (multiple-item screens), but layout may affect response rates and completion rates. Conditional branching can reduce the apparent size of a survey, and use of a progress indicator at the bottom of the page (for example, "15% complete") may motivate completion. An internet survey on attitudes toward affirmative action sampled 1,602 students, using three different design approaches (175). One version reminded respondents of their progress through the survey; one version presented several related items on one screen, while the other version presented one question per screen; and for one series of questions a random half of the sample clicked option buttons to indicate their answers, while the other half entered a numeric response in a box. Responses showed that multiple-item screens significantly decreased completion time and the number of "uncertain" or "not applicable" responses; respondents were more likely to enter invalid responses in long- versus short-entry boxes; and the use of fixed option buttons may decrease the likelihood of missing data compared with free text entry boxes (175).

1.4.5 Advantages of IMR

IMR has the potential to gather large volumes of data relatively cheaply and with minimal labour, involving automatic data input to a database of choice. For respondents there are fewer barriers to participation, for example in keeping

appointments, or posting back a questionnaire (176). This has the potential to reduce the timescale of the study. IMR may be able to address sampling biases by reaching traditionally difficult-to-access groups such as rural populations, people living with illness, frailty and disability, and shift workers. This is supported by evidence that age, nationality and occupation have typically been found to be more diverse in internet samples (169), and that IMR has been used to engage with hard-to-reach groups including 'senior surfers', disadvantaged teenagers, and people living with disabilities, dementia, and depression (176). This widening of geographical access increases the opportunities for cross-cultural research. IMR, as with postal surveys, has the potential to reduce the biases resulting from researcher presence by diminishing social desirability effects (177) and enhancing disclosure (170). Further applications of IMR surveys are that they can be used to evaluate research methodology, for example by measuring the time taken to complete each component of a task, or varying participants' knowledge of a researcher's gender or ethnicity to investigate impact on responses.

1.4.6 Disadvantages of IMR

1.4.6.1 Technical

IMR relies on access to a computer and the computer literacy of respondents. There is a risk of non-response through email invitations being recognised as Spam, or deleted as Junk. One study of student samples found that responses were lower for web-completed than paper-completed questionnaires, with the suggestion that many students had not checked their email (173). People who rely on shared computers are denied the privacy required for surveys on sensitive topics. Where internet connectivity is poor there is a risk of the programme crashing and losing data, or respondents giving up due to long pauses between screens. Without the reminder of a piece of paper there is a risk that respondents who save halfway through, with the intention of returning, may never return.

1.4.6.2 Bias

While internet samples may be more gender-balanced than traditional methods, IMR may introduce a male gender bias, although there is mixed evidence regarding this (169). The internet-user population is characterised as technologically-proficient,

educated, white, middle-class, professional males. Whilst this theoretically balances the traditional female response bias to surveys, increasing internet coverage may restore the female bias. Sampling bias may also be overcome by using closed surveys for specific invitees only.

1.4.6.3 Validity

There are issues with the validity of IMR, particularly through the lack of a relationship with participants. Without monitoring body language, tone of voice, or signs of distress there is less control over or knowledge of participant behaviour, which also raises questions about how distress might be responded to. In the absence of monitoring or programming restrictions, subjects may violate instructions, for example by backtracking to cheat in a memory task, or gaming responses to force their way down specific branches of the survey. There is the potential for contamination through third party involvement (for example, respondents consulting a friend), use of reference materials, or hoax respondents, and the potential for distraction or intoxication by alcohol or drugs, but all these issues apply also to postal questionnaires. However validity may be checked using comparison methods and programming checks. For the above reasons, IMR may be invalid for conducting diagnostic interviews requiring considerable subjective judgement on the part of the assessor. On the other hand, there is evidence that differences in the reliability of interview methods for diagnosing psychiatric disorder compared with self-administered questionnaires are only modest (178).

1.4.6.4 Ethics

The ethical problems in using IMR start with obtaining fully informed consent. Links to information sheets and consent forms may be provided, but it is difficult to check whether these have been read before ticking a checkbox linked to a statement of agreement to participate. It is important that participants are reminded that they may withdraw from the study at any time, and to provide a 'submit data' button to ensure they understand and agree that their responses are being submitted to the researcher. With data stored on web-servers and vulnerable to hacking there is a concern about confidentiality and security of data, particularly where incentive structures require identifying information to be submitted (173). It is important to assure participants of

confidentiality of their responses, and describe the data storage security measures to minimise the possibility of any other parties gaining access to the study data (169). Requiring subjects to respond to research questions at home, rather than in the formal setting of a research department, may result in a blurring of the public–private domain distinction. However this also applies to many surveys in which data is gathered by interview or postal questionnaire, and is balanced against the convenience and cost advantages to respondents and researchers. Without direct contact with respondents there is a lack of debriefing, which may be important where surveys have covered distressing topics. After submission a 'debrief' page might provide sources of support, or contact details of the researcher in case they have any queries. Ethical issues are also raised by the 'harvesting' of information from newsgroup postings and individuals' webpages, when the information was not made available for such a reason. Whilst this approach has been used to compare bereavement reactions after different modes of death (179), there are problems with the validity of these downstream methods as well as the ethical concerns.

1.4.6.5 Tolerance

Most students and staff in large institutions receive up to two email requests per day to participate in research. My impression is that these are often deleted with only a cursory glance at the content, and that exposure to low quality questionnaires quickly extinguishes respondents' motivation to participate in that or subsequent surveys. Whilst this may also have been true of postal surveys pre-internet, the risk of email survey fatigue threatens the sustainability of the email sampling method and the use of internet-mediated surveys.

1.4.7 Techniques for improving validity of IMR surveys

Guidelines suggest a range of ways in which the cost and convenience advantages of IMR can be harnessed whilst minimising potential biases and validity issues (169;180;181). It is suggested that IMR surveys state clearly the affiliation for the study, to give it credibility, enhance participation and avoid hostile responses. Surveys should provide clear electronic instructions to guide respondents, with links to further information if required. Validation checks are advisable for providing evidence that internet-mediated research measures capture what they purport to. For

example, comparing the results of an IMR study with established results of face-to-face psychometric interviewing may show systematic differences on some psychological variable. By introducing constraints on the flexibility of participants' behaviour it might be possible to control parameters that must remain constant, for example time taken to complete a task. In some contexts it may be possible to gather information about participants, such as browser type, IP address, and date and time of response, in order to detect multiple submissions. However use of shared computers and virtual private networks (VPN) would obscure this, and access to information on IP address may be unethical. It is important to pilot the study extensively in a range of samples and formats to detect any operational issues before administration of the actual study procedure.

1.4.8 Application of IMR to mental health research

The email sampling format has been used previously for the purposes of psychiatric research. A 2009 survey of trainee psychiatrists used the email distribution lists of 4 out of 8 London-based training schemes, to establish the proportion and characteristics of those who undertake personal psychotherapy (182). A web-based survey gathered quantitative and qualitative data, achieving responses from 140/294 (47.6%) trainees. This found a prevalence of 16% for uptake of personal psychotherapy, but the authors suggested that self-selection bias might have led to this being an overestimate.

University email distribution lists have been used in mental health research as a sampling frame for community-based studies. A 2005 study of the community prevalence of paranoid thoughts sampled 60,200 students at UCL, King's College London, and the University of East Anglia, by emailing them to invite participation in an anonymous internet survey on 'everyday worries about others' (183). The survey, which included 6 research scales, was completed by 1,202 students, representing a response of 1.9%. The authors reported that paranoid thoughts occurred regularly in approximately a third of the group. Criticisms of this method related to non-response bias and the representativeness of the sample. For a survey on paranoia, it was possible that the most paranoid members of the population sampled would find the topic very salient, or conversely be highly suspicious of it. This might increase, or decrease, their likelihood of responding, resulting in an over-

or under-estimate of the prevalence of paranoid thoughts. Students from the three universities participating represented a predominantly London-based Russell Group university sample, and might not be considered an epidemiologically-representative sample. Inclusion of more diverse educational institutions, both geographically and socio-economically, was indicated for future studies to improve representativeness.

1.4.9 Application of IMR to the selected research topic

Given that my target group was young, and likely to be computer-literate, IMR offered many advantages, particularly those of cost and of enhanced disclosure in relation to a sensitive topic. The option of inviting Higher Education Institutions (HEIs) to participate offered access to a large sample of young adults, at marginal cost. I planned to reduce selection bias by including staff, and by ensuring that participating institutions represented as diverse a population as possible. Deriving controls from the same sample would also mean that any such biases would be equally distributed, and this could also be addressed statistically by adjusting for socio-economic status.

1.5 Study purpose

Having outlined my reasons for choosing to investigate the impact of suicide bereavement on the mental health and social functioning of young adults, and for choosing an internet-mediated approach to collect data, I now specify the aims and objectives of this research thesis, my hypotheses and research questions, and my reasons for choosing the outcome measures used.

1.5.1 Aims and objectives

- To measure the effects of suicide bereavement on the mental health and social functioning of young adults in the UK
- To recruit a large sample of young adults who have lost a close relative or friend due to sudden bereavement and compare outcomes between those who are bereaved by suicide and those bereaved by other causes of sudden death
- To determine whether suicide bereavement is a risk factor for suicidal thoughts and suicide attempts in young adults in the UK

- To control for the sudden nature of the bereavement, by comparing outcomes with a baseline group of those bereaved due to sudden natural causes of death
- To control for the violent nature of the bereavement, by comparing outcomes with a baseline group of those bereaved due to sudden unnatural causes of death
- To explore whether any associations are equally strong in relatives of the deceased and in non-relatives
- To collect and analyse qualitative data to explore whether the stigma associated with some kinds of sudden bereavement explains any associations between suicide bereavement and adverse outcomes
- To collect and analyse qualitative data to explore which interventions are perceived by people bereaved suddenly as acceptable and beneficial.

1.5.2 Outcome selection

This study was motivated primarily by a clinical interest in suicide bereavement as a putative risk factor for suicidality; identifying suicidal ideation and suicide attempt as the primary outcomes. The research literature also indicated that depression, non-suicidal self-harm, and stigma were important secondary outcomes, as well as potential explanatory factors.

I was also keen to include functional outcomes, of social and occupational relevance to young people. These would also be of interest to those responsible for supporting young adults facing difficulties at work or in education. The functional impairment consequent to psychiatric disorders is the most important cause of sickness absence in the UK (184). While current NICE guidelines on promoting mental well-being at work (185) and on long-term sickness absence (186) recognise that bereavement may contribute to depression, anxiety, stress, and sickness absence, the evidence gathered is insufficient to determine what organisations can do to support employees who are depressed, anxious, or under stress because of bereavement. This identified social functioning and drop-out from work or education as additional secondary outcomes.

1.5.3 Research questions

- Do young adults bereaved by suicide have a greater risk of suicidal thoughts and suicide attempts compared with those bereaved by other causes of sudden death?
- Do they also have an increased risk of poor social functioning, non-suicidal self-harm, drop-out from work or education, and incident depression, and higher rates of self-perceived stigma, shame, responsibility and guilt compared with those bereaved by other causes of sudden death?
- Are adverse outcomes for people bereaved by sudden unnatural causes intermediate to those for people bereaved by suicide and a baseline group of those bereaved by sudden natural causes?
- Does self-perceived stigma explain any increased risks?
- Are any observed risks similar both in relatives and non-relatives?

An additional research question, which is addressed using qualitative methods, concerns the nature and role of any stigmatising attitudes, as well as views regarding the impact of any support received after the suicide and unmet needs for other interventions. These qualitative data will be used to explain any associations observed in the quantitative data analysis, considering the theoretical pathways to increased or decreased suicidality. The qualitative data will be analysed in the post-doctoral period, and the results are not reported in this thesis.

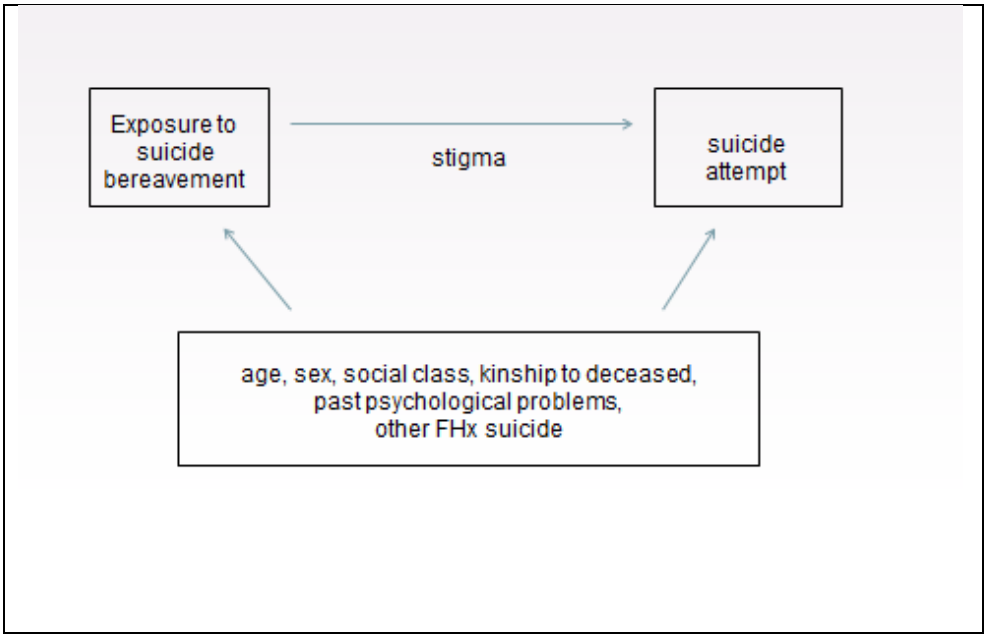
1.5.4 Overarching hypothesis

I hypothesised that bereavement by the suicide of a relative or non-relative was associated with poor outcomes in relation to the mental health and social functioning of young adults, and that these adverse outcomes might be explained at least partially by the stigma associated with suicide, once confounding factors agreed *a priori* had been accounted for (see Figure 1-2: Hypothesised relationship between exposure and suicidality).

A finding of no significant differences between groups, or a negative association between suicide bereavement and adverse outcomes (as described under 1.1.3.2.10 Theoretical framework above), would lead to my rejecting this hypothesis. This

indicated the need for a two-sided analysis plan, accommodating the possibility of either negative or positive outcomes after suicide bereavement, thus avoiding inductive bias.

Figure 1-2: Hypothesised relationship between exposure and suicidality



1.5.5 Opportunities

In designing this study I hoped to provide valuable data on a group thought to be at risk of suicide but about which little is known. By using both clinical and functional outcomes, I aimed to contribute to scientific knowledge that would be of use to clinicians, as well as to voluntary sector services, student support services, human resources departments, and the lay public. The data collected would compare the needs of people bereaved by varying types of sudden death, using objective measures of psychosocial functioning, as well as subjective experiences of helpful and unhelpful support. Analysis of this qualitative data on subjective experiences might also identify interventions for future evaluations of effectiveness. Finally, documenting the experiences of bereaved people would serve as a resource for the public in illustrating appropriate ways of responding to someone bereaved suddenly.

Chapter 2 Systematic review of studies measuring the impact of suicide bereavement on mental health and suicide mortality

2.1 Abstract

Over the past decade increased policy attention has been directed towards suicide bereavement, but with little evidence to describe the effect of exposure or to provide appropriate responses. I used a systematic approach to conduct a narrative review of controlled studies measuring the effect of suicide bereavement on mortality, mental health and social functioning compared with other bereavements. I found 57 studies satisfying strict inclusion criteria. Results from these studies suggested that exposure to suicide of a close contact is associated with several negative health and social outcomes, depending on an individual's relationship to the deceased. These effects included an increased risk of suicide in partners and mothers bereaved by suicide, increased risk of requiring admission to psychiatric care for parents bereaved by the suicide of an offspring, and increased risk of depression in offspring bereaved by the suicide of a mother. Some evidence was shown for increased rejection and shame in people bereaved by suicide across a range of kinship groups when data were compared with reports of close contacts after other violent bereavements. Policy recommendations for support services after suicide bereavement rely heavily on the voluntary sector, with little input from psychiatric services to address described risks. Policy-makers should consider how to strengthen health and social care resources for people who have been bereaved by suicide to prevent avoidable mortality and distress.

2.2 Introduction

Academic literature on the particular impact of suicide bereavement dates back to the 1960s (47), and while the concept is clinically intuitive, publications have tended to reflect clinical opinion rather than objective evidence. The adoption of controlled studies has been slow, and the majority of literature reviews on suicide bereavement have not taken a systematic approach. Such reviews have either been inconclusive

(128;187), found few differences between suicide bereavement and that by other losses (48;84), particularly between bereavement after suicide and after accidental deaths (127;129;188;189), or found that suicide bereavement is characterised only by guilt and blame (190). A systematic review restricted to the impact of parental suicide on children and adolescents found modest but inconsistent evidence for worse psychosocial outcomes compared with other bereavements (191). All reviews have pointed out the methodological problems in the evidence base.

Only one systematic review of controlled studies measuring the impact of suicide bereavement on any close contact has been conducted previously, covering publications up to January 2005 (66). As described in the previous chapter, this identified 41 studies, many of which had methodological shortcomings. Their summary finding was of no significant differences between people bereaved by suicide and those bereaved by other causes in relation to general mental health, depression, PTSD symptoms, anxiety and suicidal ideation, and no differences on measures of anger, loneliness, relief, shock, and acceptance. It did find that people bereaved by suicide reported significantly higher scores on overall grief distress, and on specific dimensions of grief; stigma, shame, blame, rejection and concealment of the cause of death (66). The review identified only one study measuring suicide attempt, finding no differences, but this was probably under-powered and used an unspecified measure of suicidality (192).

My systematic review (102) was conducted in the final year of the PhD to allow an appropriate time interval for new findings. It was commissioned by *The Lancet Psychiatry* for their launch issue in 2014, co-authored by Dr Annette Erlangsen in Denmark (see Appendix 3). The search strategy used by Sveen and Walby in the previous systematic review (66) was used as a starting point, but I widened inclusion criteria beyond subjective measures of experience to accommodate mortality measures from registry-based studies using routine clinical and service data (59;60;100;101). These analyses of linked population registries have bypassed many of the methodological obstacles of survey study designs, covering total population samples in Canada (71), Denmark (59;60) (100;101) (28;56;193) and Sweden (70;194-197), while adjusting for pre-bereavement covariates without problems of recall.

To measure the impact of suicide bereavement it is crucial that investigators are precise about exposure. In many studies, researchers use a history of suicide in a specific family member as a proxy for suicide bereavement (28;56;70;193-198). Although results of these studies show that family history of suicide is linked with higher risks of adverse mental health outcomes, including suicidality, they account for genetic risk but not necessarily shared familial environment. For this review we aimed to restrict our inclusion criteria to studies specifying a personal relationship to the person who died.

2.3 Methods

I used a systematic literature search of controlled studies, following PRISMA guidelines (199), to conduct a narrative review of evidence to measure the effect of suicide bereavement on mortality, mental health and social functioning. My aim was to examine the emotional experience of losing someone important, irrespective of whether they were related or not. Environmental exposure to suicide bereavement, namely that of a close relationship, was defined by self-report of a relationship to the deceased (in surveys) or a household variable for cohabitation (in routine datasets) (71) (59;60;101) (100). As with the previous systematic review on this topic (66), I also aimed to compare this exposure with exposure to bereavement by other causes. This was because any differences that arise from comparison with non-bereaved controls (70;104;124;200-203) do not necessarily show outcomes specific to suicide bereavement but rather the negative sequelae that might be common to all bereavements (20). Comparisons with individuals bereaved by non-suicide traumatic death were regarded as particularly informative because they control for the violent and unexpected nature of the loss, delineating the specific effects of suicide, and potentially the role of suicide contagion. I therefore restricted our search to studies confirming a proximal relationship to the deceased, and those using bereaved rather than non-bereaved controls.

I searched MEDLINE for papers published from 1 January 1946 to 22 October 2013, using the following exploded Medical Subject Headings (MeSH) terms to define exposure: ‘suicide’, ‘bereavement’, ‘genetic predisposition to disease’ and ‘family characteristics’; and the equivalent key words ‘familial’, ‘genetic predisposition’, and

'family history' (for inclusion of very recently published papers). I defined the group of interest with the exploded MeSH terms 'grief', 'friends', and 'family', the unexploded term 'survivors', and an equivalent key word search. I restricted the search to articles published in English. The search strategy was tested by ensuring that it retrieved a set of 15 key papers spanning 35 years (see Appendix 3). I repeated the search with minor variations specific to the search terms used for that database on PsycINFO (1806 to 22 October 2013), EMBASE (1980 to 22 October 2013), and CINAHL Plus (1937 to 22 October 2013). I also conducted secondary searching of references cited in identified articles and related reports known to the reviewers, with additional references suggested by experts in the field. Inclusion criteria were: exposure to suicide bereavement (as defined by participants) or to the suicide of a household member (confirmed by use of a household variable in routine datasets); controlled studies using a bereaved comparison group; and the existence of primary data. The paper selection flow chart, including exclusion criteria, is shown in Figure 2-1: Paper selection flow chart.

I extracted data from full-text articles with use of a proforma based on STROBE criteria (204). Annette Erlangsen and I used these criteria to assess methodological quality and risk of bias in individual studies independently, both at the study and outcome level, including any apparent selective reporting of outcomes within studies. Disagreements were resolved by consensus. We used this assessment of bias in the interpretation of each study's findings. Because of the heterogeneity of study populations, kinship relationships, and outcome measures in the 57 papers identified, I used a narrative approach to synthesise findings.

2.4 Results

A total of 57 studies fulfilled these inclusion criteria (see Figure 2-1: Paper selection flow chart). Many of these had methodological shortcomings similar to those noted in the previous review (66); namely small sample sizes; selective and non-representative samples (e.g. from bereavement support groups or psychology classes); low participation rates; recall biases; unadjusted analyses; use of unstandardised instruments, and an admixture of different kinships (see the full table of results in Appendix 3). This body of evidence indicates that exposure to suicide

bereavement occurs in characteristic contexts. The relatives and non-relatives of people who die by suicide differ from those not exposed to suicide bereavement on a range of socio-demographic and clinical characteristics, even before the bereavement (see Figure 2-2: Risk factors for suicide bereavement). Differences in physical health, such as tobacco use, physical inactivity, and adverse childhood experiences, are likely to be markers of pre-existing income inequalities, and are all associated with mental disorders (71). Compared with those bereaved by natural causes and accidental deaths, people bereaved by suicide recall receiving less support from others both before and after the death; either reflecting recall bias or the difficult social circumstances associated with caring for a suicidal person (205). These relations underline the importance of controlling for the potential confounding effect of pre-bereavement psychopathology, suicidality and social functioning, as well as for family history of suicide, other history of suicide (or other) bereavements, and socio-demographic variables. Because of these issues, my discussion prioritises findings of studies that have appropriate adjustments.

Figure 2-1: Paper selection flow chart

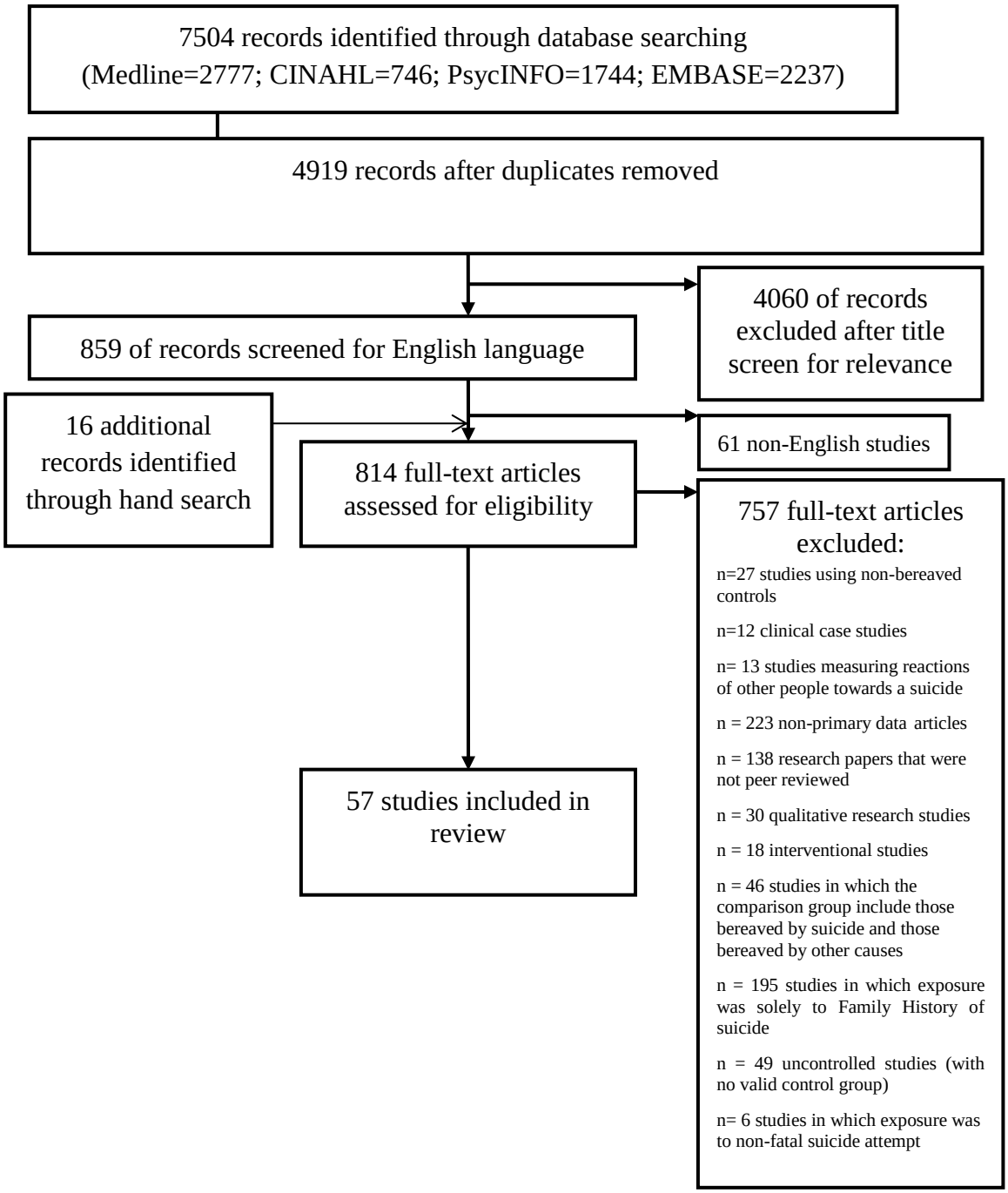


Figure 2-2: Risk factors for suicide bereavement

Relatives

- Mothers bereaved by the suicide of an adult son are more likely than mothers bereaved by the motor vehicle death of an adult son to have experienced separation experiences in their own early childhood (206).
- Parents bereaved by the suicide of a child had an excess of mental disorders, physical disorders, single status, and low income before their offspring's death compared with non-bereaved parents and with parents bereaved by motor vehicle death (71).
- School-age children bereaved by the suicide of a parent seem to have a significant excess of behavioural and anxiety disorders (192) and of parental separation or divorce (207) before the death, compared with children bereaved by non-suicide death of a parent.
- Surviving parents of children bereaved by parental suicide had a significantly lower educational level than those of children bereaved by non-suicide parental death (208)
- Offspring of people who died by suicide had significantly elevated rates of any psychiatric disorder prior to the suicide, when compared with non-bereaved controls (58).

Non-relatives

- The partners and ex-partners of people who died by suicide had higher rates of depression and any psychiatric disorder prior to the suicide, when compared with non-bereaved control individuals (58).

2.4.1 The role of kinship

The impact of suicide seems to vary according to kinship, affecting parents (especially mothers), widowers and sisters more than adult offspring, brothers and widows (209). It may also vary by time since the bereavement (88;210). Several earlier studies used samples of heterogeneous relationships, which tended to show no differences in psychosocial outcomes between people bereaved by suicide and those

bereaved by other mortality causes (69;209;211;212). Such heterogeneity may have given rise to type II errors, particularly because kinship is suggested as a better predictor of outcome than is bereavement cause (209). For greater clinical usefulness the results of this review are subdivided by kinship and summarised in the sections below (see also Figure 2-3: Summary of findings), with the full table of results presented in Appendix 3. Outcomes are therefore described separately for partners or ex-partners, parents of deceased offspring, offspring of deceased parents, siblings, and samples of mixed kinships. While the impact of suicide bereavement may also depend on the closeness or quality of the relationship (68;213), no studies identified in this search employed validated measures of perceived closeness.

2.4.2 Adults bereaved by the suicide of a partner or ex-partner

Studies based on data from Danish registries show that exposure to a spouse or cohabitee's suicide in the last 2 years carries a high risk of suicide (adjusted risk ratio (ARR)=21.69; 95% CI=11.10-42.37) compared with non-bereaved controls, as does spouse's death by other causes (ARR=7.65; 95% CI=4.97-11.78) but as confidence intervals overlap the two bereaved groups are likely to have similar risks of suicide (59). Direct comparison to those bereaved by non-suicide causes in a gender-stratified model showed that risk of suicide was elevated in men (Wald statistic=8.42; df=1; p=0.004) and women (Wald statistic=7.06; df=1; p=0.008) bereaved by a partner's suicide (60). Risk of suicide in the widowed was not explained by assortative mating, using a proxy measure of psychiatric admission in both partners, suggesting that suicide contagion or grief responses were implicated (59).

Among Danish adults aged 42-71 with a first admission for depression, risk of past spousal suicide (ARR=3.41; 95% CI=1.69-6.90; p<0.001) does not appear to differ from the risk of past spousal non-suicide bereavement (ARR=2.46; 95% CI=1.86-3.25; p<0.001), as confidence intervals overlap (101). Neither analysis of US (214;215) nor European (216-218) survey data showed differences in levels of depression or psychopathology in widows bereaved by suicide *versus* widows bereaved by non-suicide violent causes, but findings were not adjusted for pre-bereavement psychopathology. Similarly, comparison of longitudinal data from the

USA for spouses or ex-spouses bereaved by suicide with data for those bereaved by non-suicide or non-homicide death found no differences on a range of standardised measures of depression and other psychopathology at 1 month, 6 months, 13 months and 25 months after the death (207). Direct comparison with spouses bereaved by accidental death in a US population showed no differences in grief scores reported 2-4 years after the loss (219).

Older adults bereaved by the suicide of their elderly spouse in the last two months had higher anxiety scores than those bereaved by natural deaths, but were no different on measures such as obsessive or depressive symptoms (126). Over the subsequent 2.5 years, depressive and obsessive symptoms declined significantly more in the suicide-bereaved (220). However, neither analysis had adjusted for past psychiatric history.

2.4.3 Parents bereaved by offspring suicide

Analysis of data from Danish registries shows that exposure to the suicide death of an adult child significantly increases a parent's risk of suicide (adjusted odds ratio (AOR) =2.54; 95% CI=1.78-3.64; p=<0.01) although estimates just overlap with the elevated risk demonstrated for parents bereaved by non-suicide death (AOR=1.40; 95% CI=1.08-1.81; p=<0.01), suggesting no differences (100). However, direct comparison of suicide-bereaved mothers with mothers bereaved by non-suicide causes shows that risk of suicide is significantly higher for mothers bereaved by suicide (chi-2=7.30; p<0.01) (100). Extension of analysis of these registries to offspring of any age showed that risk of parental suicide after recent exposure to the suicide of a child of any age (ARR=2.31; 95% CI=1.23-4.34) was similar to that of parents exposed to non-suicide death of a child (ARR=1.90; 95% CI=1.51-2.40), due to overlapping confidence intervals (60). Direct comparison appeared to show an excess risk of suicide in the suicide-bereaved, but not when adjusted for lifetime parental admission for psychiatric care, identifying mentally-ill parents bereaved by a child's suicide as a high-risk group (60).

It is hypothesised that the death of an adolescent or young child has worse outcomes for parents than the loss of a child who has reached independence (100). However,

Danish registry-based data show that among adults aged 42-71 with a first admission for depression, risk of past suicide of their offspring of any age (ARR=1.95; 95% CI=1.30-2.92; p<0.01) does not appear to differ from the risk of past offspring non-suicide death (ARR=1.11; 95% CI=0.91–1.35; NS), as confidence intervals overlap (101). Comparison of Norwegian survey data showed no differences in grief or distress scores between parents bereaved by the suicide of offspring aged up to 29 years *versus* parents bereaved by the accidental death of a child aged up to 18 years (221). Data based on Canadian registries, adjusted appropriately, showed no excess risks for suicide attempts, specific mental disorders, relationship breakdown, or financial hardship in parents bereaved by the suicide of offspring of any age compared with parents bereaved by offspring death in a motor vehicle crash (71). However, although rates of psychiatric hospitalisation were significantly higher in the suicide-bereaved parents (p=0.049 for period x exposure interaction), rates of depression were significantly higher in the parents bereaved by motor vehicle crash (p=0.005 for interaction) (71). These differences are consistent with other less rigorous studies showing evidence that some psychiatric outcomes are worse in parents bereaved by violent non-suicide causes than parents bereaved by suicide. For example, comparison of outcomes in a US cohort of parents bereaved by suicide, homicide, accidents and undetermined deaths showed an excess risk of PTSD in parents bereaved by homicide at each follow-up point over 5 years, but this study used an unstandardised measure of PTSD based on DSM-III-R PTSD criteria and was not adjusted for past psychiatric history (222) (223) (224).

2.4.4 Offspring bereaved by parental suicide

Children losing a parent by suicide share familial loading for psychiatric disorder and suicidality, and, in addition to their own mourning, may also experience a change in quality of their parenting while the surviving parent grieves (225), including a fear of further abandonment (208). Danish registry-based data permit indirect comparison of parental suicide bereavement with parental non-suicide bereavement. When adjusted for family psychiatric history, a first admission for depression in offspring aged 42-71 was associated with an increased risk of past bereavement by the suicide of a mother (ARR= 2.04; 95% CI=1.40-2.95; p<0.001) but not past bereavement by the non-suicide death of a mother (ARR=0.78; 95% CI=0.59–1.03; NS) (101). As these

confidence intervals do not overlap, maternal suicide bereavement can be assumed to confer an excess risk of depression compared with maternal non-suicide bereavement, although this would require direct testing. Confidence intervals for the elevated risk of past paternal suicide in offspring admitted for depression (ARR=1.68; 1.19-2.36; p<0.01) overlap with those for the non-significant reduction in risk of paternal non-suicide death (ARR=0.96; 95% CI=0.74–1.24; NS), so risks might be assumed to be no different (101).

Survey data from a US state show that schoolchildren bereaved by suicide reported more severe depressive symptoms after a parent's death than those bereaved by a cancer death, but this was not adjusted for pre-bereavement baselines (226). Other studies with relatively small sample sizes of offspring aged up to 25 have shown no differences, for example in grief, mental health, and child and family functioning among suicide-bereaved children and those bereaved by parental death due to accidents (208) (58;227).

2.4.5 Sibling suicide

Among Danish adults aged 42-71 with a first admission for depression, risk of past exposure to bereavement by the suicide of a sibling (ARR=2.12; 95% CI=1.28-3.48; p<0.01) did not appear to be significantly different from the risk of past sibling non-suicide bereavement (ARR=1.09; 95% CI=0.80–1.48; NS), as confidence intervals overlap (101). In an international twin study, Segal compared reports from twins bereaved by a co-twin's suicide (aged ≥15) to reports from twins bereaved by a co-twin's non-suicide death. The group of suicide-bereaved twins reported a significantly increased frequency of suicidal ideation (p<0.01) and suicide attempts (p<0.01) in the immediate aftermath of the death (228). Findings are tentative, given the unadjusted analysis and the use of non-standardised instruments, but a within-group comparison noted that monozygotic twins bereaved by suicide had a higher risk of suicide attempt than dizygotic twins bereaved by suicide (17% *versus* 0%; p<0.01) (228). This finding is either explained by closer shared environments among monozygotic than dizygotic twins, or provides further support for a genetic basis for suicidal behaviour, additive to the risks associated with shared familial environments.

Figure 2-3: Summary of findings

Partners bereaved by suicide:

- Increased risk of suicide in the 2 years after a partner's suicide compared with partner's death from non-suicide causes (60)
- No apparent differences in risk of admission for depression after spousal suicide compared with spousal non-suicide death (101)
- No differences in spousal depression and other psychopathology after the suicide of a spouse compared with death of a spouse due to other violent and non-violent causes (207;214-219)

Parents bereaved by offspring suicide

- No apparent differences in risk of a parent's suicide after the suicide of offspring of any age compared with offspring non-suicidal death (60)
- Increased risk of maternal suicide after the suicide of an adult child, in comparison with the non-suicide death of adult offspring (100)
- No apparent differences in risk of parental admission for depression after offspring suicide compared with risk after offspring non-suicide death (101)
- Higher risk of hospital admission for mental illness among parents bereaved by the suicide of offspring of any age than for parents bereaved by motor vehicle crash, but higher risk of depression in parents bereaved by motor vehicle crash (71)

Offspring bereaved by parental suicide

- Indirect evidence for increased risk of offspring admission for depression after maternal suicide bereavement compared with bereavement after non-suicide death, but no apparent differences in risk after paternal suicide compared with paternal non-suicide death (101)
- Risk of more severe depressive symptoms in schoolchildren after a parent's suicide compared with parental cancer death (226)

Sibling suicide

- No apparent difference in risk of admission for depression after sibling suicide bereavement compared with sibling non-suicide death (101)

2.5 Discussion

2.5.1 Policy implications

This review notes several adverse outcomes associated with suicide bereavement; notably depression, and fatal and non-fatal suicide attempt. Risk seems to differ by kinship group, with partners (60) and mothers (100) of people who die by suicide being the only groups with clear evidence for increased suicide risk. These findings are striking because policies for suicide prevention tend to regard people bereaved by suicide as a unitary group (110;111). Pre-bereavement psychiatric illness seems to account for any increased risk of suicide among suicide-bereaved parents (60); findings that help to identify sub-groups of individuals in need of targeted support after suicide. The real concern is that although systems are in place to manage the suicide risk of suicide-bereaved people in treatment for mental health problems, it is unclear how non-clinical populations of affected peers and relatives might best be screened or offered support, particularly in situations where they do not share the deceased's family doctor. Furthermore, the scarce evidence for effective interventions does not provide an evidence base for choosing whether a focus on primary or secondary prevention is more appropriate.

This review also shows numerous similarities between outcomes in people bereaved by suicide and those bereaved by sudden violent death, with many studies showing no differences on several standardised measures of grief intensity, stress reactions, and psychopathology (58;88;205;209-212;214-219;221;223;229-234). Results of one registry-based study showed significantly higher rates of depression in parents bereaved by motor vehicle crash than in those bereaved by suicide, with the authors suggesting that the suicide deaths may have been more anticipated than the vehicular deaths (71). Caregivers of suicidal people describe many years of being on 'suicide-watch', with 79% of the suicide decedents in one US sample having given clear signs

of intent to family members by means of expressing suicidal thoughts or plans, or by previous attempts (68;69). In the month prior to their child's suicide, 44% of parents in a Swedish sample had worried that their child might attempt to take their own life (70), and qualitative research has documented the relief from this anxiety that some carers experience following a suicide (68;69).

Although it is well-established that the majority of people who die by suicide have a diagnosable mental disorder (7), those who die by unnatural causes have a higher risk of alcohol misuse and anxiety disorders (235). Direct comparison shows that similar proportions of psychiatric disorders seem to occur in adults dying by accidental death and adults dying by suicide (58). Similarities extend to suicide and accident prevention strategies in which there are cost-effectiveness advantages in tackling common risk factors (145). Given the many parallels between suicide bereavement and that by other violent deaths, and the possibility of complicated grief arising from any bereavement (236), cause of bereavement may not be as good a determinant of the need for intervention as are difficulties coping *per se* (208). Even so, the very specific circumstances of the suicide of a loved one suggest that tailored responses will be most acceptable to bereaved people, particularly interventions to address associated stigma.

Although at present, support services following suicide bereavement are concentrated in the voluntary sector, adverse mental health outcomes are often within the remit of psychiatric services. Policy-makers will need to strengthen the responses of health and social care services to this group if they are to mitigate the clear risks of suicide and depression. Such efforts have the potential to minimise distress, improve productivity, and contain costs of health care treatment.

2.5.2 Remaining gaps in knowledge

2.5.2.1 Cross-cultural comparisons

Only two of the studies satisfying inclusion criteria were conducted outside the US or Europe; both from Japan (232;233). These showed few differences in mental health between family members bereaved by suicide and by other violent deaths (232;233). Given culture-specific responses to suicide, findings from local settings are unlikely

to be generalisable elsewhere. Studies that used only non-bereaved controls suggest tentatively that in communities in India (237), Hong Kong (238;239), Australia (62), and China (203) and in Inuit communities (240) traumatic bereavement (including suicide bereavement) is associated with a higher risk of depression, poor social functioning, and suicide attempt. However region-specific studies that use appropriate controls are needed.

2.5.2.2 Stigma

Many studies of risks for self-reported stigma are flawed by methodological problems, particularly when investigators use unstandardised instruments, convenience samples, and mixtures of kinships, and do not test a main hypothesis. Studies using validated measures show that experiences of stigma, shame and lying about the cause of death are not unique to suicide, with such reactions found to some degree in all bereavement groups, particularly those due to violent deaths (132;219;234;241). Nevertheless scores on dimensions such as stigma, responsibility, shame, and rejection are significantly higher for people bereaved by suicide compared with bereavement by natural and unnatural causes (88;132;234;241). Specific comparisons with violent causes of death indicate that people bereaved by suicide report significantly higher scores on rejection (219) and shame (88;234), although these analyses were not fully adjusted.

Evidence for a differential loss of support seems contradictory (219) (234), as does that for social functioning (192) (209) (136;242), and there is a clear need for further studies that use validated measures of perceived social support and social functioning. Objective measures of how much help is offered to bereaved individuals, and of their degree of self-isolation, will also help determine whether feelings of shame in individuals bereaved by suicide reduce their sense of being worthy of any help available, and where the avenues for intervention might lie. The scope of this review did not allow inclusion of qualitative articles, from which great insights are to be gained. I also did not include studies of the views of others towards people bereaved by suicide (83), which could help to determine whether certain kinships are perceived to need more support than others.

2.5.2.3 Suicide contagion

Despite great interest in measuring the role of imitative suicidal behaviour among young people (62), many studies of adolescent populations were excluded from this review due to their use of non-bereaved controls (see Appendix 3). Results from youth surveys in one US state indicate that the peers of adolescents who died by suicide had an increased risk of mental health problems (213;243-246) but not of suicidal ideation or attempts when compared with non-bereaved controls (243) (245;246). Analysis of data from a larger, nationally-representative US sample showed an increased risk of suicidal thoughts and attempts in adolescents after the suicide of a peer compared with non-bereaved controls (247) (248). Analysis of data from a similarly representative Canadian sample found that 14-15 year olds exposed to a peer's suicide had an increased risk of suicidal ideation and of suicide attempts compared with non-bereaved controls (17). Despite these findings, similar studies using adult samples (16) highlight the possibility of confounding by gender, age and relationship status. Although this literature contributes to our understanding of adolescent suicidality, future studies that use control groups composed of individuals bereaved by violent death will help distinguish between the environmental risks For those studies using routine data to define exposure it is possible that in youth samples a greater proportion of suicides may be differentially misclassified as accidental deaths than in older samples. This will tend to over- or under-estimate risk estimates, but sensitivity analyses involving simulations of reclassification may be useful for exploring the robustness of findings.

2.5.3 Future work

Future quantitative studies will be of greatest value if they assess the risks associated with bereavement due to suicide stratified by kinship, distinguishing clearly between a family history of suicide in a specific family member and direct experience of a bereavement reaction, and between exposure to fatal and non-fatal suicide attempt. This last distinction is important because of the interest in assessment of the differential effects of exposure to a range of suicidal behaviours and to irresponsible suicide-reporting in the media (62). Although analyses based on national registries may represent the most rigorous studies available (71;101) (59;60;100), overcoming

their drawbacks in lacking adequate measures of relationship quality or social functioning will be important.

Research instruments that capture the concept of grief might require further development since they show contradictory findings when used in the same controlled comparisons (219) (241). Revised instruments will also need to take account of shifts in disease classifications in relation to grief. In DSM-5 the 2-month 'bereavement exclusion' was removed, allowing depression to be diagnosed 2 weeks after a bereavement and prompting accusations of the medicalization of grief (42). Greater consistency in the measurement of grief will help investigators both to compare outcomes between groups, and to compare the results of different studies.

This work might help to develop interventions to reduce risk of adverse outcomes, and increase understanding of the factors that explain or modify the above risks. Evidence suggests that these include gender (224); baseline depression (249); past psychiatric history (58) (71); family psychiatric history (60); perceived social support (224); and imitative behaviour (59). Age at bereavement seems to modify risk in children (194) but not in adults (101). Risk might also vary by closeness to the deceased but no studies used validated measures of closeness. Thus, development of a standardised research instrument is required for future work. Finally, longitudinal work should identify the time points during which risks are greatest and when support is most acceptable, thereby guiding the targeting of interventions.

2.5.4 Response to the findings of this review

The press release accompanying the publication of this systematic review (102) in *The Lancet Psychiatry* (250) highlighted the policy implications of the review, describing the reliance on the voluntary sector to support the suicide-bereaved as "unsustainable and inappropriate" without the necessary funding. Samaritans countered by emphasising that the contribution of the voluntary sector was an important complement to the statutory sector (251). By this, they appeared to have misunderstood the article as having suggested they lacked the skills required to support and manage the traumatically-bereaved. Cruse Bereavement Care responded by highlighting the need for statutory agencies, including NHS, social services and

education professionals, to "work alongside those in the Voluntary Sector and people from local communities to ensure that all those affected have appropriate help" (252). They also acknowledged the vital role played by the charitable sector, and others who come into contact with the bereaved, such as GPs, employers, teachers, faith leaders and friends and neighbours (252).

2.6 Conclusions

This review has outlined several negative outcomes specific to suicide bereavement, including an increased risk of suicide in partners bereaved by suicide; of suicide in mothers bereaved by an adult child's suicide; of admission to psychiatric care in parents bereaved by offspring suicide; and of depression in offspring bereaved by maternal suicide. The range of kinships affected suggests that all members of the immediate family need screening and appropriate support. Gaps in knowledge about the effect of peer suicide should be addressed, and investigators should delineate how extensively to offer support within the deceased's social circle. This review has also indicated the many similarities between outcomes in people bereaved by suicide and those bereaved by sudden violent death in relation to grief intensity, stress reactions, and psychopathology. Some investigators suggest that higher rates of depression in parents bereaved by vehicular deaths are explained by suicide bereavement being more anticipated than death caused by an accident. The improvements I suggest in approaches to measuring the impact of suicide bereavement will refine knowledge of the sub-groups in greatest need, and the time points during which people are at greatest risk. An important next stage is to identify approaches to screening this population, and to trial interventions to address their increased risk of early mortality and psychological distress.

Chapter 3 Methods

3.1 Hypotheses

3.1.1 Primary hypothesis

The primary hypothesis under investigation was that young adults bereaved by suicide would report higher rates of incident suicidal thoughts and attempts, poorer social and occupational functioning, higher rates of non-suicidal self-harm and incident depression, and greater self-perceived stigma than young adults bereaved by other causes of sudden death.

I used three comparison groups: 1) people bereaved by sudden natural death; 2) people bereaved by sudden unnatural death; and 3) people bereaved by suicide. This permitted comparison of:

- Groups 2) and 3) to a baseline group of people bereaved by sudden natural causes (to control for the sudden nature of the death)
- Group 3) to a baseline group of people bereaved by sudden unnatural causes (to control for the violent nature of the death).

A non-bereaved control group was not additionally included on the basis that it would be difficult to elicit responses from a representative sample of non-bereaved adults, thus introducing non-response bias. Wording the invitation to participate in a study applicable to bereaved and non-bereaved subjects would also be problematic. Use of a valid non-bereaved control group would only be possible if analysing routine databases.

3.1.2 Secondary hypotheses

Including two bereaved control groups allowed me to test a secondary hypothesis that outcomes for the group bereaved by unnatural causes would be intermediate to the other two groups.

Other secondary hypotheses were that:

- stigma would explain any associations between suicide bereavement and adverse outcomes
- there would be no interaction with kinship to the deceased, such that risk of any adverse outcomes in those bereaved by suicide or by sudden unnatural causes would be present (or absent) in both relatives and non-relatives of the deceased.

3.2 Study design

I conducted a descriptive study using a cross-sectional survey design, to collect quantitative and qualitative data from young bereaved adults in the UK, comparing outcomes between three groups; those bereaved by suicide, those bereaved by sudden natural death, and those bereaved by sudden unnatural death.

3.3 Funding and ethical approval:

This study was funded by a Medical Research Council Population Health Scientist Fellowship, following a process of peer review and competitive interview. Ethics approval (see Appendix 5) was granted by the UCL Research Ethics Committee (August 2009).

3.4 Recruitment

After considering a range of methods for sampling a population of young adults, including those identified in my review of the literature on internet-mediated research methods, the mass email approach was judged to be the most accessible and low-cost means of reaching this risk group in the appropriate age range. Using diverse institutional distribution lists minimised the biases involved in using a help-seeking sample (82;179;201;208;210;212;228-230;232;253;254), or un-representative student samples (90;205;211;234;241;255;256), allowed contact with a large number of people at minimal cost, and had advantages over other methods which I considered in detail. For example clients of voluntary organisations such as Cruse or Samaritans would be self-selecting help-seekers; a primary care sample recruited by letter from practices in the MRC General Practice Research Framework

(GPRF) risked a low response from young adults and was prohibitively expensive; and requests to access coroners' records had been denied.

Higher education institutions (HEIs) were chosen as the sampling frame because of the relatively high Higher Education Initial Participation Rate (HEIPR) of 46% in England for 17 to 30 year-olds in the academic years 2008/2009, 2009/2010, and 2010/2011 (257). This method had also been used successfully in population-based psychiatric research previously (183), but the sampling bias in that study guided a decision to widen participation to all HEIs in the UK so as to increase diversity.

I anticipated that the factors favouring a higher response from eligible individuals using the university email sampling method were that the recipients would be: a defined and captive population, accustomed to participating in email or internet surveys, sympathetic towards research activity, proactive and internet–literate, young (minimising misgivings they might have about recall problems), and able to participate at no direct financial cost. Additionally, the email originated from a credible source; a university and not an external commercial agency (169;172). I opted for a closed survey (invitation only) using the internet rather than an open survey (available on the internet to anyone) because it would restrict responses to this sampling frame and provide information about the denominator (discussed later under 3.12 Sample size calculation).

3.4.1 Initial invitation

The Vice-Chancellors and/or Directors of Research at all 164 HEIs in the UK were approached via email during 2009/2010 and invited to participate in the study. The 164 HEIs were all those listed on the Universities UK website in 2010 http://www.universitiesuk.ac.uk and subsequently on the Higher Education Statistics Agency (HESA) returns on numbers of students in Higher Education Institutions 2009/2010 (258) (see Appendix 6a - Table of responses by UK HEI). The aim was to include as many UK universities and colleges as possible in order to represent the diversity of the student population, including HEIs from all four devolved nations, and those with and without membership of the Russell Group of universities. This group denotes those universities that receive the highest income from research

funding bodies, and are characterised by high competition for student places and staff contracts.

The email to each HEI explained that participation would involve circulating a study invitation by email individually to each staff and student member. Further contact was made by phone and/or email where additional information was required. Considerable efforts were made to contact non-responders, to encourage the broadest participation possible. A total of 37 HEIs consented to participate in the study, representing a response of 23% of UK HEIs (see Figure 3-1).

Figure 3-1: Participating HEIs

England: (n=29)
Bishop Grosseteste University College Lincoln
Bournemouth University *
Central School of Speech and Drama
City University
Cranfield University
Courtauld Institute
De Montfort University **
University of Greenwich
King's College London
Liverpool Institute for Performing Arts
Liverpool John Moores University
London Metropolitan University
Norwich University College of the Arts
Royal Veterinary College
School of Oriental and African Studies
St George's London Staffordshire University
Trinity Laban Conservatoire of Music & Dance
UCL
University Campus Suffolk
University of Bedfordshire***
University of Chester
University of Cumbria****
University of Leeds †
University of Liverpool ***
University of Oxford †
University of Southampton
University of Worcester
University of Westminster
Scotland: (n=4)
Queen Margaret University
Heriot-Watt University**
Scottish Agricultural College
University of Dundee**
Wales: (n=2)
Cardiff University
University of Wales Institute Cardiff (now Cardiff Metropolitan University) *****
Northern Ireland: (n=2)
Queen's University Belfast
University of Ulster

Key: *italics* denotes Russell Group university. Symbols indicate variations in the sampling method.

* denotes brief sampling email to all staff & students inviting contact with researcher

** denotes email news digest method for all staff and students

*** denotes intranet advert to all staff and direct email for students

**** denotes email news digest method for staff and direct email for students

***** denotes intranet advert to all staff and students

† denotes student sample only

The 37 participating HEIs provided estimated figures for the number of staff and students on their email distribution lists (see Appendix 6b: Table of responses by HEI) as follows:

567,109 students + 92463 staff = 659,572 staff and students

In some cases estimates of the numbers of students were based on Higher Education Statistics Agency (HESA) figures (258), and estimates of the numbers of staff assumed a 14% proportion of the total student-staff population. This sample of 659,572 staff and students represented approximately 23% of the total estimated student and staff population of all 164 UK HEIs at that time, estimated as follows:

Total student population of all 164 HEIs = 2,553,250 students (258)

Estimated total staff population of all 164 HEIs = 14% of 2,553,250 = 357,455

Estimated total staff and student population of all 164 HEIs = 2,910,705

Estimated total staff and student population in 37 participating HEIs
Estimated total staff and student population of all 164 HEIs

= 659,572 / 2,910,705 = 23% of total HEI student and staff population

3.4.2 Instructions for participating HEIs

Each HEI was requested to send the invitation to participate from an email address within that HEI. This enhanced its credibility in having gained institutional support and to prevent it being classed as Junk. A neutral email address (e.g. postmaster@xxx.ac.uk or bereavementstudy@xxx.ac.uk within central administration) was used to avoid an association with figures of authority, counselling services or a department of mental health. This also reinforced the idea of confidentiality, and avoided being seen to consider grief as pathological. The email indicated that the researcher was from UCL, again to enhance institutional credibility (172).

Universities were requested to use a mass email (e.g. using lists for allstaff@ and allstudent@) sent to each individual staff and student address to invite participation. The individual email approach is associated with higher response rates (172), and the additional justification I provided the HEIs with was as follows:

> "We realise that in some universities there are reservations about sending out mass emails, for administrative or policy reasons. Therefore a crucial issue for us to demonstrate in gaining the funding and the ethics approval was that this was an important research area that would be worth the potential distress/inconvenience of being sent such an email. In designing the methodology we thought hard about the alternative sampling options, including using posters, or the college/university intranet, newsletter or messaging options, but we felt that the lack of a denominator and the potential for response bias would undermine the methodology substantially. In the case of a poster this would exclude all those who tend not to spend time in communal areas, in the case of the Message of the Day this would exclude all those who happened not to log on that day, and in a general newsletter it would exclude those who don't read beyond the title. We decided on the mass email approach to all those studying at or employed by the university because it:
>
> a) directly accesses the non-help-seeking population (on whom there exists very little information)
>
> b) establishes the response rate from the denominator
>
> c) greatly reduces sampling bias and helps gain a more accurate picture of young people's mental health and level of functioning in the bereaved population.
>
> d) provides useful information for the university on the unmet needs of students and staff (in the form of disaggregated data for Student Support and HR respectively)"

The last of these points was used as an incentive for HEIs to participate. The invitation was clear that data would be collected in separate databases for each participating institution so that it would be possible to analyse results per institution and compare them to the sample as a whole. This individual feedback (anonymised and broken down further into staff and student samples) constituted a reward for participation, providing each HEI with a useful needs assessment for their Student Support and Human Resources departments.

3.4.3 Variations in recruitment methods

The 37 HEIs consented to participate on the understanding that each staff and student member would receive an individual email inviting them to take part in the survey. Subsequently, due to concerns about either the sensitivity or the practicalities of the suggested sampling strategy, 10 of the 37 HEIs elected to slightly adapt the mode of recruitment (see previous Figure 3-1).

One HEI (Bournemouth University) sent out an initial brief email to all staff and students, inviting those interested to contact bereavementstudy@ucl.ac.uk for further details and for the link to the survey. Three HEIs (University of Bedfordshire, University of Cumbria, and the University of Liverpool) elected to use the email method for their students and to post an intranet advert or email news digest for their staff. Three HEIs (De Montfort University, Heriot Watt University, and the University of Dundee) were unable to send the email out as a direct invitation, but instead sent it out as part of their weekly news digest email. One HEI (University of Wales Institute Cardiff) advertised the study on its intranet site. Two HEIs (the Universities of Leeds and Oxford) preferred to send the email to students only. As the University of Oxford was restricted by its collegiate system, the email was sent to students at 8 of the 44 colleges (see Appendix 6b); a sub-sample judged by the Director of Student Welfare and Support Services to be representative of the university's students.

Given these variations in sampling methodology, the plan for the main analysis was to include data from all recruited participants, but to use sensitivity analysis to

determine whether excluding the 10 HEIs that had used differing sampling approaches influenced findings. This analysis excluded 55,213 individuals (8%).

3.5 Inclusion criteria

- All those employed at or studying at a participating UK university or college: I used a closed survey design, restricted to those working or studying at each of the 37 HEIs, so that a denominator could be established for the sampling frame (but not the denominator for those who had experienced a sudden bereavement). This also established the population baseline characteristics, so that the limits of generalisability were clear. Membership of a university or college was defined by being a direct recipient of the sampling email from the university/college's email distribution list.
- Current age 18 to 40: This age range was defined to reflect the group of greatest policy interest at the time of designing the study, and a cohort shown to be susceptible to the effects of social modelling (55).
- Adults of any nationality: Consultation with the Royal College of Psychiatrists' working group on student mental health indicated that it was important to reflect the diversity of the UK HEI population and to include overseas students (259), recording ethnicity.
- Experience of any sudden bereavement: For the purposes of this survey sudden bereavement was defined subjectively by email recipients i.e. if they felt it was a sudden and unexpected bereavement then they were eligible to participate. The sampling email (see Appendix 7) defined sudden bereavement as "a death that could not have been predicted *at that time* and which occurred suddenly or within a matter of days". This could also apply to someone who was diagnosed with a serious illness and lived with this illness for a while, but who then died earlier than had been expected, with little or no warning (260). Mode of death was defined subjectively by the respondent, and not by coroner's verdict or death certificate, as perception of bereavement type was the exposure of interest. The email explained "This may have been due to natural causes (for example an epileptic seizure, cardiac arrest, or a stroke), or unnatural causes (for example a road crash, homicide, or suicide)". For non-suicide deaths, no data were collected on specific cause of death to

reduce the risk of drop-out. Index bereavement was analysed according to three groups: a) sudden natural death (e.g. cardiac arrest, epileptic seizure, stroke); b) sudden unnatural death (e.g. road crash, murder or manslaughter, work accident); and c) suicide.

- Experience of sudden bereavement of a close contact: A close contact was defined as 'a relative or friend who mattered to you, and from whom you were able to obtain support, either emotional or practical'. This wording was designed to include the full range of kinships, including the 'hidden bereaved' (contacts outside the deceased's immediate social circle and secret relationships) (1). This expanded definition of closeness was a response to the many studies investigating only one or few kinship relationships (102) and US research on adolescents suggesting that more peripheral members of the social network may be at greater risk of suicidal behaviour after exposure to peer suicide (108).

3.6 Exclusion criteria

- Experience of sudden bereavement occurring before the age of 10: This is the age of criminal responsibility in England and Wales, and defines the age at which an individual is deemed mature enough to be tried legally for an offence in court. It was therefore chosen as the age representing the threshold for adult cognition. Exclusion of bereavements prior to this also reduces the potential for recall bias of events or processes in childhood.
- Participants who did not complete responses for at least one outcome measure were excluded from the final analysis.

3.7 Questionnaire design

Given the advantages that my review of sampling methods had identified in relation to internet-mediated data collection (see 1.4.5), an online questionnaire was chosen as a cost-effective way of collecting quantitative and qualitative data. The questionnaire was constructed on the basis of advice derived from research experience in quantitative and qualitative questionnaire design (261-267), and the questionnaires used in previous studies surveying people bereaved by suicide (221)

(268) (269), covering the domains suggested by existing resources for the suicide-bereaved (138).

Based on available guidance on the design of internet-mediated questionnaires (169;176) I ensured that the UCL logo was prominent (for institutional credibility), and entitled the survey 'the UCL Bereavement Study'. I used multiple-item screens (to decrease completion time, reduce N/A responses, and save data with each page change), short-entry boxes (to reduce invalid responses), and fixed option buttons (to reduce the need for coding) where possible. Free text boxes were included where extra information might be required, recognising their limitations (270). Outcome measures (described in detail below) included the CIDI lifetime depression screening tool (271) (272), which has been validated for use in an online format (273). The email invitation and survey webpage contained clear electronic instructions with links to further details. Information was provided on confidentiality and what to do in the case of distress. A debrief page containing sources of support was made available throughout the questionnaire via a button at the foot of the page. Conditional branching was used where possible to reduce the survey's apparent size.

3.7.1 Consultation Group input

Successive drafts of the study questionnaire were revised with the input of a consultation group of bereavement counsellors, qualitative researchers, and individuals who had experienced a sudden bereavement by either suicide, natural causes or unnatural causes. This group provided feedback on content, wording, ordering and visual effect. The colour scheme and layout were reviewed for appeal to young adults of both genders. Their suggestions resulted in some questions being removed, and others added or amended. At the end of this process we felt reassured that the questionnaire addressed those clinical and functional areas relevant to a study of this kind. A draft of the sampling email was piloted in a sample of young working adults to confirm acceptability. The final draft of the questionnaire and sampling email (see Appendix 7) were then submitted to the UCL Research Ethics Committee and approved (July 2009), ready for piloting.

3.7.2 Software

I used Opinio software (ObjectPlanet, Opinio. ©1998-2010, licensed to UCL) to host the survey on the basis of its cost (free to UCL staff) and sophistication compared with other commercial software. Branching restrictions were incorporated into the questionnaire so that it was theoretically not possible for anyone to proceed if they were:

- not students or staff at the 37 institutions participating
- aged under 18 or over 40
- had experienced the sudden bereavement before the age of 10.

Barriers to participation on the basis of age were accompanied by a message indicating that the restriction "in no way implies that bereavement has a lesser impact in other age-groups, but allows us to focus on a specific sub-group which has tended to be under-represented in work of this kind. If your age is outside this range we cannot use your responses in the data analysis, but thank you for having volunteered your time". Additionally I explained: "The survey starts at the age of 10 because children tend to react to bereavement in different ways to adolescents or adults, and because there may be difficulties remembering events in childhood." Where recipients queried the age range by email I sent them a personalised response re-iterating the above and explaining that "once we have written up the results we will be discussing what direction to take next in terms of sampling focus".

For those who had experienced more than one of these types of bereavement, filters within the online questionnaire directed anyone who had experienced suicide bereavement down a pathway in which this was identified as the index bereavement, and all subsequent responses were related to their experience of suicide. In the case of more than one suicide bereavement the instruction was: "If you have been bereaved by suicide more than once please answer the rest of this questionnaire in relation to one person - the person to whom you felt closest". For respondents who had experienced more than one non-suicide bereavement the guidance was to: "answer the rest of this questionnaire in relation to one person - the person to whom you felt closest", specifying how that person had died, and what other non-suicide bereavements they had experienced.

3.8 Exposure definition

For the purposes of this analysis, participants were allocated to one of three groups as follows: bereavement by suicide, bereavement by sudden natural death, and bereavement by sudden unnatural death. In the case of exposure to more than one of these types of bereavement, a protocol for prioritisation was applied:

- All those bereaved by suicide were classified as exposed to suicide bereavement (regardless of exposures to other non-suicide bereavement)
- Those bereaved by both sudden natural causes and sudden unnatural causes were classified as either sudden natural death or sudden unnatural death depending on the cause of death of the deceased person they chose to relate the questionnaire to; i.e. the person to whom they felt closest.

3.9 Outcome measures

3.9.1 Primary outcomes

Suicide attempt was chosen as a primary outcome measure because, although deliberate self-harm is an established risk factor for suicide in the UK, such studies have tended not to measure intent (32). I wanted to use established measures to distinguish acts of self-harm with intention to die from those with no intention to die, using the former as a primary outcome and the latter as a secondary outcome. I also included suicidal ideation as a primary outcome, presuming it would co-occur with suicide attempt if the latter was present.

For these measures I used the suicidality questions from the Adult Psychiatric Morbidity Survey (APMS) (274;275), which provides estimates of population norms for the lifetime prevalence of suicidal thoughts, suicide attempt, and self-harm (without suicidal intent) in England. These questions are taken from the Revised Clinical Interview Schedule (CIS-R); a standardised instrument with demonstrated validity and reliability (178). For each suicidality question a positive response is followed up with a question clarifying whether this last occurred in the past week, past year or at some other time, generating prevalence figures for past week, past year, and lifetime suicidal ideation, suicide attempt and self-harm. I modified this

wording to: "*Was this: before the bereavement, after the bereavement, or both before and after the bereavement?"*.

Although my primary outcomes related to incident (post-bereavement) suicidal ideation and suicide attempt, my power calculation (see 3.12) was based on lifetime suicidal ideation and suicide attempt, given no equivalent figures.

Thus the primary outcomes were:

- self-reported suicidal ideation post-bereavement using the standardised APMS measure (274;275) based on the question "*Have you ever thought of taking your life, even if you would not really do it?*", qualified by whether this was before or after the sudden bereavement, or both, to derive a measure of post-loss suicidal ideation
- self-reported suicide attempts post-bereavement using the standardised APMS measure (274;275) based on the question "*Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?*", qualified by whether this was before or after the sudden bereavement, or both, to derive a measure of post-loss suicide attempt

3.9.2 Secondary outcomes

1) Social dysfunction as measured on the Social Functioning Questionnaire (276). This is an eight-item self-report scale, in which scores are converted into a binary variable at a designated cut-off, to yield values of poor and good social functioning. The SFQ has been in use for 20 years, producing robust data in populations with relatively minor mental illness. It is used to measure current social function in the Department of Health's Adult Psychiatric Morbidity Surveys, providing valuable normative data for the general population in 2000 and 2007 (274;275).

2) Incident non-suicidal self-harm (post-dating the bereavement) using the standardised APMS measure (274;275) based on the question "*Have you ever deliberately harmed yourself in any way but not with the intention of killing yourself?*", with time-frame adapted as for the primary outcomes above.

3) Post-bereavement drop-out from work or education, using a binary measure of drop-out from either work or education, which was constructed for the study based on responses to two questions: "*In relation to your education, have you ever had to drop out of a course at school, college or university?*"; "*In relation to your employment history have you ever: been made redundant / been disciplined / resigned from a job for negative reasons / been given notice from employment*?" In each case a qualification was elicited as to whether this had been before or after the bereavement, or both.

4) Incident depression (post-dating the bereavement) as measured using the 2-item screen for lifetime depression from the Composite International Diagnostic Interview (CIDI) (271;272). This is a standardised instrument for which there are European population norms, for example 51% of a 2003-2004 UK general practice sample aged 18 to 39 screened positive (277). Online administration of the anxiety and depressive disorders section of the CIDI has also been validated (273). The screen uses one question to assess depressive symptoms and age of onset, and one question to assess anhedonia and age of onset, with respondents screening positive if both symptoms are confirmed. As the lifetime screen excludes current depression, it specifies symptoms "*apart from in the last 6 months*", which for this study therefore excluded measurement of this variable for all those reporting a bereavement in the 6 months prior to being surveyed. Using ages of onset from the CIDI lifetime depression screen, a variable was derived to record onset of depression after the index bereavement, and this was used as a secondary outcome. Using a similar method a variable was constructed to record those reporting onset of depression before the bereavement, for use as a clinical descriptor.

5) Stigma in relation to the death: using the stigmatization subscale of the Grief Experience Questionnaire (GEQ) (278), as revised in 2000 (279), with permission from Dr Terence Barrett. This is a standardised instrument for the assessment of the phenomenology of grief, and is described in more detail below.

6) Shame in relation to the death: as above, using the GEQ shame subscale (279).

7) Responsibility in relation to the death: as above, using the GEQ responsibility subscale (279).

8) Guilt in relation to the death: as above, using the GEQ guilt subscale (279).

The GEQ is a self-administered standardised instrument designed to measure 11 specific dimensions of grief (Barrett and Scott, 1989). Originally designed as a 55-item measure to yield an overall score and 11 subscale scores, it was revised on the basis of principle components analysis to yield 8 meaningful subscales (279). As with a number of previous surveys of the suicide-bereaved (88;280) (132), I used subscales of the GEQ as outcome measures rather than overall score, in order to make comparisons of specific dimensions of grief. I selected 4 of the original 8 subscales (derived from 26 items): stigmatization (self-stigma), shame (the bereaved person's sense of embarrassment about the cause or circumstances of the death), responsibility (the bereaved person's sense that they might have caused the death), and guilt. While the concept of stigma encompasses both self-perceived stigma as well as experiences of overt discrimination (85), the GEQ stigma subscale reflects only the former, using questions such as: "*How often did you… feel like a social outcast? … feel avoided by friends? … think people were gossiping about you or that person?*".

Also as with other research groups using the GEQ (241;280), I slightly modified the original wording for suitability in a young adult sample. Thus in the stem I replaced deceased 'spouse' with 'person' and changed the timeframe from 'in the first two years after the death' to 'since the death'. Respondents were then asked questions in the format: "*(Since the death) how often did you: …think that people were uncomfortable offering their condolences to you? … feel like others may have blamed you for the death?"*

3.10 Other covariates derived:

3.10.1 Socio-demographic characteristics:

- gender: using ONS census categories (male and female) (281)
- age: eligible age range of 18 to 40

- work status: using the OECD standard of 30 hours as a cut-off for full-time/part-time status (282)
- sick leave in last year: number of days
- socioeconomic status: social classes were assigned by recoding free text responses on own occupation (for staff) or the occupation of a parent or other source of financial support (for students) using the National Statistics Socio-economic Classification (NS-SEC) based on the Office for National Statistics Standard Occupational Classification 2010 (SOC2010), as used by the Universities and Colleges Admissions Service (UCAS). This is a common classification of occupational information for the United Kingdom, with jobs classified in terms of their skill level and skill content (283). I changed this to a 5 category classification by collapsing social classes 1.1 and 1.2 into category 1, and social classes 5 to 9 into category 5.
- level of educational attainment (based on the 5 levels used in the Whitehall II prospective cohort (284)**:** no academic qualification, lower secondary education, higher secondary education, university degree, higher university degree. This was dichotomised at A level attainment (285), such that the categories were educated to A level, or to degree level and above.
- ethnic group: using the ONS Census categories (281)
- religion: using the ONS Census categories (281) but adding Protestant/Catholic/other Christian group sub-specifications for Christians and instead of 'None' using the sub-specifications 'No religious affiliation but holding religious beliefs/atheist/agnostic'
- marital status: using the ONS Census categories (281)
- number of children
- living situation: including options for student halls of residence
- three measures of social support from the Adult Psychiatric Morbidity Survey (APMS) (275), derived from the Interview Measure of Social Relations (IMSR); a standardised instrument with demonstrated reliability (286), and population norms (287):
    - primary group size: defined as the total number of close relatives and friends

- a measure of regular contact with other people: defined as the number of people a respondent communicated with in the last week
- level of social support: categorised as no/moderate/severe lack of perceived social support

3.10.2 Clinical characteristics:

- personality disorder screen: using the 8-item Self-report Standardised Assessment of Personality-abbreviated Scale (SAPAS), a standardised instrument with demonstrated reliability and validity in psychiatric out-patient samples (288;289), with permission from Dr Paul Moran
- current psychological distress screen: using the K10, a 10-item questionnaire yielding a global measure of distress based on questions about symptoms of non-specific psychological distress in the last 30 days (290). Scores range from 10-50, with a cut-off of 20 and above scoring positive, and US population norms for a positive screen in 13% of the US population and 25% of the US primary care population.
- grief screen: one item taken from Prigerson's PG-13; a 19-item Inventory of Complicated Grief (43), with permission from Professor Holly Prigerson. It involved fixed-choice responses to the question "*In the last month how often have you had intense feelings of emotional pain, sorrow, or pangs of grief related to the person who died*?" This was chosen to encapsulate grief and explore its relationship to other clinical variables, but without using the full inventory for reasons of questionnaire length.
- pre-bereavement lifetime depression: derived from the 2 item CIDI lifetime depression screen (271), modified as discussed above (see 3.9.2 Secondary outcomes)
- past psychiatric history: using a measure constructed for the study based on responses to the question "*Have you ever had an anxiety disorder, a depressive disorder, drug or alcohol problems, or other mental health difficulties*?" + CIDI screen for lifetime depression
- past treatment history: using a measure constructed for the study based on responses to the question "*If you have had psychological or emotional difficulties, have you ever had help for this from any of the following: general*

practitioner / practice nurse / practice counsellor /a psychiatrist in an out-patient appointment?"

- psychiatric admission history: using a measure constructed for the study based on responses to the question "*Have you ever been an in-patient in an acute mental health ward*?"
- history of thinking life is not worth living: using a standardised APMS measure (274;275) based on the question "*Have you ever felt that life was not worth living?*", with the time-frame adapted as for the primary outcomes.
- history of wishing one was dead: using a standardised APMS measure (274;275) based on the question *"Have you ever wished that you were dead?"*, with the time-frame adapted as for the primary outcomes.
- family history of psychological problems: using a measure constructed for the study based on responses to the question "*Has anyone in your family suffered from an anxiety disorder, a depressive disorder (including postnatal depression), had drug or alcohol problems, or other psychological or emotional difficulties*?", followed by a specification of which family members (to check relatedness)
- family history of suicide: using a measure constructed for the study based on responses to the question "*Have any of your blood relatives died by suicide*?" followed by followed by a specification of which family members (to check relatedness and to separate out the index bereavement). This allowed family history of suicide to be classified by degree of relatedness, using Wright's coefficient of relationship (291).

3.10.3 Variables relating to the deceased:

- gender of the deceased: using ONS census categories (male and female) (281)
- age at time of bereavement: coded as a continuous variable, and a binary variable (aged under 18 *versus* aged 18 and over)
- time since bereavement: coded as a continuous variable, and a binary variable (dichotomised at 2 years to accommodate anniversary reactions)
- age of the deceased: coded as a continuous variable, and a binary variable (aged under 18 *versus* aged 18 and over), with miscarriage and perinatal

death defined using the WHO definition of perinatal mortality up to one week of age

- kinship to the deceased: coded in terms of specific relationship, and also as a binary variable (blood relative *versus* not a blood relative)
- frequency of contact in the year prior to death: coded as daily, weekly, monthly, every 2-3 months, every 6 months, yearly, or not at all during that year; also coded as a binary variable (weekly or more *versus* less than weekly)
- length of relationship with the deceased, determined by responses to the question "*Approximately how long before their death had you known this person for*?"
- closeness to the deceased at time of death: rated on a Likert scale from 0 ('Not close at all') to 5 ('As close as any relationship I've had before or since'). Results were dichotomised so that responses of 1-3 were classified as 'quite close' and responses of '4-5' were classified as 'very close'. This Likert scale has not been formally validated but has been used previously in similar studies (241;255).
- closeness to the deceased prior to death: given the possibility of estrangement in the period prior to death we also asked respondents to rate previous closeness in cases where the relationship "*had previously been closer or more distant*"
- worst stage of bereavement: immediately afterwards / up to a week / up to a month / up to 6 months / up to a year / up to 3 years / over 3 years

3.10.4 Help-seeking variables:

- timing of receipt of help "*that was valuable to you*" after the bereavement: within a day / week / month / 6 months / a year / over a year / at no time.
- type of help received after bereavement: options include none, self-help, police, funeral directors, coroner, NHS staff, private counsellor, voluntary sector, friend, website, school staff, university staff, employer, minister of religion, other.
- help received after any episode of self-harm since the bereavement: binary variable collapsing responses to options adapted from APMS questions (275)

in relation to help provided by friends, family, GP, hospital, counsellor, CMHT, minister of religion, voluntary organisation, college staff, and other.

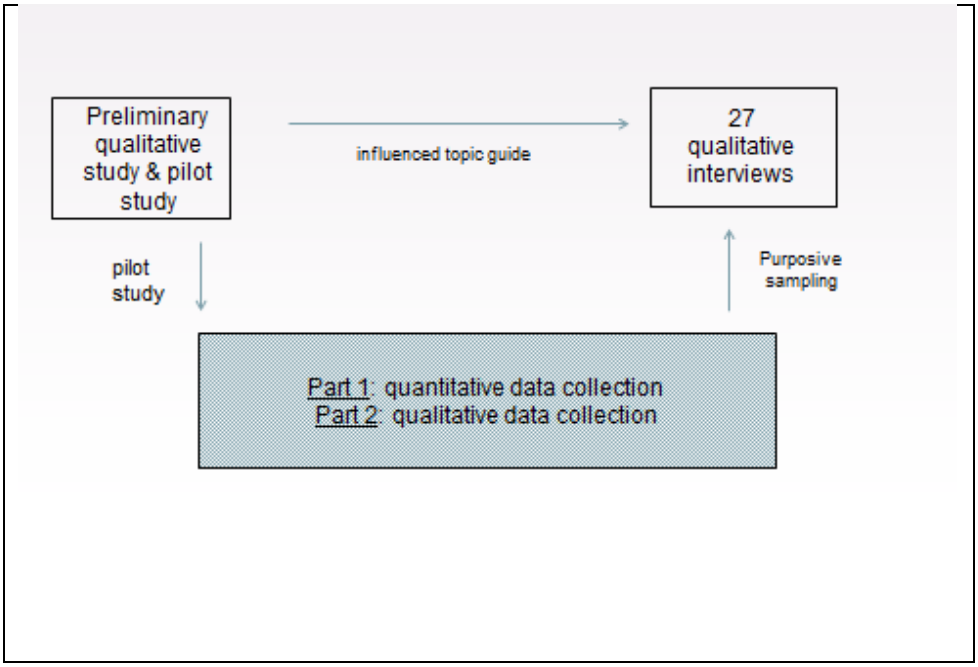
3.11 Questionnaire structure

An illustration of how the components of the study inter-related is provided below (see Figure 3-2: Structure of cross-sectional study components).

3.11.1 Part 1 Quantitative

The first part of the questionnaire presented 120 questions (approximately 1-6 per page) answered using forced-choice response formats and Likert scales, with some free text boxes for addition of clarifying detail. These questions elicited information on index bereavement (cause of death, kinship and closeness to deceased, support available, use of support services), socio-demographic variables (current age, age at bereavement, socioeconomic status, ethnicity), and potential confounders (family history of mental illness, previous psychiatric illness, history of suicidality prior to bereavement). Responses were saved each time the respondent moved to a new page.

Figure 3-2: Structure of cross-sectional study components



3.11.2 Part 2 Qualitative

3.11.2.1 Online data

The second part of the survey collected qualitative data using 20 questions with free text responses. This was felt to be the best way for participants to describe specific areas affected (either positively or negatively), including what support they had found helpful or unhelpful. The aim was to take a broad approach, and not just probe mental health issues. Questions were worded to be non-leading and neutral (i.e. not assuming only negative outcomes from bereavement), and were derived from qualitative interviews described in key publications (50;168) and input from the consultation group. The questions elicited information on the impact of the bereavement in a variety of domains: changes in relationships with family, friends, partners, and work colleagues; use of drugs and alcohol; finances; educational and professional progression; spirituality; reactions of other people; experiences with professionals; experiences of a funeral, memorial service, or inquest; hidden or emerging information; experiences of people avoiding the topic of the death; experiences of hidden grief; fear of dying the same way; and experiences of help received. Analysis of qualitative data is not presented as part of this thesis, as this will be analysed during my post-doctoral fellowship, but the analysis plan is described at the end of this chapter.

3.11.2.2 Qualitative interviews

On reaching the end of the survey, respondents were invited to participate in face-to-face interviews to explore the themes covered in the free text questions in more detail. The sampling strategy and analysis plan are described at the end of this chapter. Again these qualitative data are not presented as part of this thesis, and will be analysed during the post-doctoral fellowship.

3.12 Sample size calculation:

The study was powered in relation to the suicide-bereaved group, who were predicted to represent the smallest of the three groups, on the basis that suicide rates are less than accident/homicide mortality rates, and those for sudden natural deaths.

Also, as published figures for rates of sudden natural deaths do not cover all possible causes it was not possible to calculate exposure to this.

The **sample size calculation** was based on the following assumptions and research evidence, in relation to the primary outcomes; suicidal ideation and suicide attempt. After discussions with consultant psychiatrists, I judged a doubling of the risk of suicide attempt and a 50% increase in risk of suicidal ideation to be clinically significant. Given the possibility of finding either positive or negative outcomes following suicide bereavement, the power calculation was based on all tests of statistical significance being two-tailed with 90% power.

3.12.1 Baseline rates

I used ONS population figures for lifetime suicidal ideation and suicide attempts in UK adults, based on the Adult Psychiatric Morbidity Survey (APMS) in 2000, for which prevalence figures are given by age-group (274). As the inclusion criteria for age (18-40) in my study spanned three different age-groups used in the APMS I used the median of these as the baseline value for each primary outcome.

In relation to APMS figures for **lifetime suicidal thoughts**, prevalence by age-group was 17.3% for ages 16-24; 18.4% for ages 25-34; and 17.0% for ages 35-44, giving a median value of 18.4% as the baseline value. Using STATA software, a one-sided calculation showed that a sample size of n=378 per group would be required (with 90% power at a p-value threshold of p=0.05) to detect a relative risk (RR) of 1.5 for lifetime suicidal thoughts. A two-sided calculation showed that I would require **n=460** per group with 90% power.

In relation to APMS figures for **lifetime suicide attempts**, prevalence by age-group was 7.7% for ages 16-24; 6.5% for ages 25-34, and 6.1% for ages 35-44, giving a median value of 6.5% as the baseline value. Using STATA software, a one-sided calculation showed that a sample size of n=385 per group would be required (with 90% power at a p-value threshold of p=0.05) to detect a RR of 2.0 for lifetime suicide attempts in those bereaved by suicide. A two-sided calculation showed that I would require **n=466** participants per group with 90% power (p=0.05). I took this

higher figure of the two primary outcomes (**n=466**) as my minimum group size for any exposure.

3.12.2 Predicted response

I predicted a response from 10-20% of eligible individuals, based on previous studies (221;292), feedback from preliminary interviews with suicide-bereaved individuals, the pilot study (described below), and communication with researchers who had used the university email sampling method (183). Given that there are no data describing the number of people exposed to sudden bereavement in the population, I estimated the denominator exposed to suicide bereavement based on national suicide rates and the international literature on suicide bereavement, making the conservative assumption that 75% of all staff and students emailed would be aged 18-40, and the then widely-accepted estimate that 6 people are directly affected by each suicide (84). On this basis the exposed denominator represented the product of the following items:

- Estimated total students and staff in the 37 participating HEIs = 659,572
- Estimated proportion aged 18-40 = 75%
- 2005 England and Wales suicide rate for men aged 15-24 = 8.5/100,000 (148)
- Minimum estimated number of close contacts affected by each suicide case = 6 (84)
- Maximum person years at risk (exposure to suicide-bereavement since age 10) ranging from 8-30. Median person years at risk = 20

Thus, the estimated total number of suicide-bereaved recipients aged 18-40 in 37 HEIs = 659,572 x 0.75 x 8.5/100,000 x 6 x 20 = 5,046

A response from 10-20% of eligible people in the group exposed to suicide bereavement was estimated to represent 504-1,009 individuals; exceeding the n=466 required for the study to achieve adequate power.

3.13 Pilot study

3.13.1 First pilot

The questionnaire was first piloted in autumn 2009 using the email sampling method, but a help-seeking sampling frame. I gained permission from the national voluntary organisations Survivors of Bereavement by Suicide and Widowed by Suicide to survey their client group using the pilot questionnaire. This contained 97 quantitative questions and 76 qualitative (free text response) questions. Approximately 160 bereaved people received a direct email inviting participation (63 members of Survivors of Bereavement by Suicide and roughly 100 members of Widowed by Suicide), and 17 responses were received, giving an approximate response of 11%. On the basis of their responses I cut down the questionnaire length, and made some changes to wording to ensure that questions in the qualitative section of the main questionnaire were as open and non-leading as possible.

At the end of the first pilot I had invited feedback on the questionnaire content and this was wholly positive, ranging from "*It felt good to give my opinion. Thank you.*" to longer comments such as "*I want to thank you for giving me the opportunity to talk about what loss and bereavement have meant to me – you're the first to ever ask me and it feels so beautiful to think that someone finally has tried to hear the pain I feel and address it for me*". On the basis of other suggestions I also revised the Information Sheet to include the following text: "*Through piloting the questionnaire we have tried to address all those areas suggested as relevant by bereaved people, as well as those areas highlighted by previous research. If you do not wish to answer any of the questions please skip it and move to the next one*".

3.13.2 Second pilot: preliminary study

With the collaboration of the national voluntary organisations Cruse Bereavement Care and Samaritans, I was able to further pilot the qualitative component of my questionnaire. This informed the design of the final survey questionnaire and my interview topic guide, and also provided preliminary data for qualitative analysis of responses in relation to any stigma associated with sudden death. I used an open online survey, which was advertised on the websites of Cruse Bereavement Care and

Samaritans throughout January and February 2010. This invited participation from individuals bereaved by suicide, sudden natural causes of death, or sudden unnatural causes of death. The questionnaire contained the 28 qualitative questions planned for Part 2 of the main survey. As this was an open survey no denominator or response rate could be derived but 36 responses were received. Qualitative analysis of the data collected in this pilot study was conducted using the approach of thematic analysis; a way of identifying patterns or themes within passages of text commonly used for analysing people's free text responses to questions (293). I wished to explore whether any stigma associated with certain modes of bereavement served to isolate individuals, affect their relationships, or influence help-seeking behaviour. My findings, presented at the start of the Results chapter, informed the design of the main study in two ways:

3.13.2.1 Implications for content

It was apparent that the experiences of stigmatising attitudes, difficulty finding valuable help, avoidance of the topic of death, and hiding one's grief were common to all bereavement groups, and this influenced the rewording of specific questions in the final survey as well as the interview topic guide.

3.13.2.2 Implications for design

Wording was modified where it appeared to have influenced the length of responses (for example, prompting monosyllabic answers), and visual appearance was improved.

The revised questionnaire was then resubmitted as a minor amendment to the UCL Research Ethics Committee who approved it in February 2010. The questionnaire used for the cross-sectional study is shown in Appendix 7.

3.14 Administration of questionnaires

The sampling email (see Appendix 7) was sent out by each participating HEI between February and December 2010, with a 6 month window for responding. The wording of the email aimed to mask the study hypothesis. It was entitled "Have you experienced a sudden or unexpected bereavement? Invitation to participate in

research studying the impact of sudden bereavement on young adults." The text invited recipients aged 18-40 to participate in the UCL Bereavement Study: a study of the impact of sudden unexpected bereavement on mental health and social functioning. The email clarified that responses were anonymous, and that the researchers were particularly interested in hearing from those bereaved by sudden unexpected death, including accidents, cardiac events, and suicide. Embedded internet links directed respondents to:

- the UCL Bereavement Study website, which included a list of national bereavement services and sources of bereavement support (see Appendix 8)
- the study's information sheet and consent form (see Appendix 9)
- the email address for any queries: bereavementstudy@ucl.ac.uk
- contact details for the university/college counselling services for students and staff (each university or college varied in terms of whether they wished details of their own counselling service to be mentioned, with the default option being the list of national bereavement services and sources of bereavement support given on the UCL Bereavement Study website)

An email reminder was sent out to each HEI two weeks after the initial invitation, for onwards circulation to all those in their distribution lists. This was in line with research indicating that responses to postal research questionnaires are higher if follow-up contact is made (172).

3.15 Data entry and data cleaning

At the end of the data collection period, quantitative data was downloaded from the survey website to a .csv format which was imported into STATA 10. Free text responses were recoded into numerical variables. New variables were created by destringing each existing variable, examining each for distribution and conducting range checks. Repeated cross-checking was used to identify implausible responses, using free text information to amend any anomalies. Following data cleaning, which took some months, 10 respondents were chosen at random to check that all variables were numeric and correctly assigned.

3.16 Distribution of continuous variables

Distributional diagnostic plots (using the *qnorm* command in STATA) were used to demonstrate whether parametric methods were appropriate for handling scores on the stigma, shame, responsibility, guilt GEQ subscales (see Appendix 10). These indicated that the subscales for stigma and shame were normally distributed, but those for responsibility and guilt were skewed, even when transformed to log values. Previous cross-sectional surveys using the GEQ indicated no standard approach to analysing scores; handled variously as continuous measures (for mean overall scores and mean subscale scores) (132), using ranked transformation (279), and dichotomisation (88). After checking residuals I decided to preserve the stigma and shame sub-scales as continuous variables, but to transform the GEQ subscales for responsibility and guilt into tertiles (low, medium and high scores). This decision was made because continuous variables are preferred where possible to preserve statistical power and variability (294). In the case of responsibility and guilt, transformation to tertiles was chosen because creating ordinal categories is preferred to dichotomizing at the median, for reasons of loss of information (295). Score category thresholds for responsibility (low = score 5; medium = scores 6-8; high = scores 9-25) and guilt (low = 5-11.6; medium = 12.5-15.8; high = 16.6-25) differed due to their differing distributions.

A decision was made to compare mean GEQ subscale scores (or GEQ subscale tertile categories) because this was more clinically relevant than using the standardised mean difference. I wished to answer a clinical question about self-reported stigma in an individual bereaved by suicide compared directly to an individual bereaved by sudden natural causes, or to an individual bereaved by sudden unnatural causes. I wished to control for the sudden nature of the death and for the violence of the death. In this clinical context, direct comparisons would be more easily interpretable than comparisons of an average effect.

3.17 Missing data:

Given the sensitive nature of the research topic and the mode of delivering a long (140 question) survey questionnaire via internet, I predicted that any missing data would be classified in one of three ways:

3.17.1 Missing completely at random (MCAR):

Values are defined as MCAR if the fact that an observation is missing is unrelated both to the unobserved value (and hence to patient outcome) and to the data that are available (295). The probability of an observation being missing therefore does not depend on observed or unobserved measurements. Under an assumption of MCAR, analysing only those respondents with complete data allows valid inferences without the problem of bias (because it is considered a random sub-sample of the original sample), although there would be some loss of information which would result in loss of power and reduced precision.

In this survey design, examples of values MCAR might include:

- respondents clicking tick boxes in haste and failing to notice that one or more were unticked
- respondents not noticing certain questions due to the layout of the page
- drop-out due to loss of internet connection
- drop-out due to interruptions
- drop-out due to saving progress but forgetting to return and complete survey.

The last three points might also be liable to the influence of socio-economic differences, and could also be classified as MNAR, covered next.

3.17.2 Missing not at random (MNAR):

Values are defined as MNAR if the fact that an observation is missing is related to the unobserved value and cannot be predicted by any other recorded variables. This is the most problematic pattern of missing data, as there will be systematic differences between the individuals with missing data on that variable and those with complete data, and those differences cannot be inferred from other values. Under an assumption of MNAR, analysing only those respondents with complete data leads to biased estimates (because the sub-sample of cases represented by the missing data are not representative of the original sample), with loss of power and poor precision.

In this survey design, examples of values MNAR might include:

- drop-out due to loss of internet connection associated with socio-economic factors (for example reliance on use of public computing services, poor quality home internet connection)
- drop-out due to psychological distress of questionnaire causing response fatigue
- drop-out due to being interrupted (more likely in those with greater social connectedness or those with more domestic/work responsibilities)
- drop-out due to pressure of time (more likely in low income groups under pressure of caregiver and work roles)

3.17.3 Missing at random (MAR):

Values are defined as MAR if they are missing in a predictable way that does not depend on the missing value itself but which can be predicted from other data (295), for example the tendency of people with depression not to answer questions on income. The probability of a value being missing therefore depends on other observed values, so it cannot be described as totally at random. Under an assumption of MAR, analysing only those respondents with complete data introduces bias (again because the sub-sample of cases represented by the missing data are not representative of the original sample), as well as the loss of information resulting in loss of power and poor precision.

In this survey, examples of values MAR might include:

- a male tendency not to answer questions on psychosocial health or functioning.

3.17.4 Assumptions

I used the *mvpatterns* command in STATA to list the missing values patterns of the variables and their frequency. These patterns gave rise to the prediction that three patterns of missing data were operating:

- drop-out at a specific point in the survey:

    - most likely to be primarily due to data MNAR where due to length and possible distress
    - a possible minority due to data MCAR (or MNAR) where computer crashed or respondent was interrupted
- a skip pattern of isolated missing values on individual questions
    - most likely to be due to data MNAR if the question was sensitive
    - possibly due to data MAR if other socio-demographic characteristics, such as gender, explained non-response to a sensitive item (for example on psychiatric history)
    - possibly due to data MCAR if respondents clicked tick boxes in haste and failed to notice that one or more were unticked
- a skip pattern of isolated missing values on individual items within multi-item covariates:
    - most likely to be due to data MCAR if the question was non-sensitive, or if the respondent was distracted from the screen, or rushing through repetitive test batteries
    - possibly due to data MNAR if the specific item was more sensitive than others in the same battery (e.g. the question on sex life within the SFQ)
    - possibly due to data MAR if other socio-demographic characteristics, such as gender, explained non-response to a sensitive item (for example if males were less likely to answer the question on sex life in SFQ or on any questions about psychological health)

To illustrate this categorisation, *mvpatterns* showed that 64% of all respondents answered all 26 items from the GEQ (to measure stigma, shame, responsibility and guilt), 30% answered none of them (presumably because they had dropped out by this stage), 4% dropped out at some point within the 26-item battery (presumably due to response fatigue within the GEQ), and the remainder (2%) showed an apparently random skip pattern of individual items having been skipped. Consequently the predominant pattern of missing data within the GEQ was assumed to be MNAR.

Respondents who dropped out of the survey before completing at least one outcome measure were excluded from the analysis. Their missing data were regarded as

primarily MNAR due to response fatigue. Chi-squared (χ^2) tests for differences between proportions were conducted to explore socio-demographic characteristics distinguishing those completing at least one outcome measure and those dropping out before this point.

For those completing at least one outcome measure (usually by reaching the GEQ at question 63 out of 120 questions), I assumed that the majority of missing data within their responses were MNAR (due to the sensitive nature of specific questions, and to response fatigue), with a minority due to data MAR (due to a male tendency not to answer questions on psychological problems), and a small minority due to data MCAR (due to not noticing that items had not been ticked). However, this could not be verified. Where data was missing for isolated items within multi-item descriptive variables (e.g. IMSR for social support; SAPAS for personality disorder) or outcome measures (SFQ, GEQ, CIDI) missing data within multi-item variables were regarded as MCAR (skip pattern) or MAR (with other variables explaining missing data).

I examined distribution of missing values by key socio-demographic variables, to assess potential for bias. I used the threshold of <6% for an acceptable level of missing data per key variable. This was more stringent than the widely-used threshold of <10% due to the sensitive nature of the questionnaire and the potential for missing data introducing bias. Authors of each measure were contacted for advice regarding handling missing data, but reported that they had not used imputation previously.

I used listwise deletion (a sub-type of complete case analysis) which meant that for the analysis of each outcome, any case with a value missing for the outcome variable or any of the model covariates was deleted. This meant that all 8 of the models used for each outcome (using block adjustment to investigate the clinical relevance of each), involved the same sub-set of respondents, all of whom had complete data for all those variables considered in the model. These sub-sets varied from n=3032 for shame to n=3030 for incident depression (see Table 4-1: Extent of missing data on key variables by exposure group), theoretically affecting comparability of the risk estimates for each of the 10 outcomes measured. However the extent of overlap for

these sub-samples in relation to primary outcomes (99.9%) suggested the appropriateness of comparing risk estimates.

The listwise deletion approach described above was chosen over other approaches for three reasons:

- Although pairwise deletion (or available case analysis) would have preserved more cases than listwise deletion, it is more sensitive than listwise deletion to any departure from an assumption of data being MCAR, producing more biased estimates. Given that I predicted a high level of data MNAR on key variables involving sensitive questions, such as those screening for suicide attempts, it was felt that listwise deletion was more appropriate for a dataset in which there was a departure from the MCAR assumption.
- I was primarily interested in the fully-adjusted model rather than in comparing any intermediate steps.
- The comparatively low levels of missing data (1.3-6.8% for outcome measures, and 0-7.0% for key covariates), meant that the maximum proportion of the sample dropped from the analysis of any outcome using listwise deletion would be 11% for primary outcomes and 12% for secondary outcomes.

No imputation of missing values was used for the main analysis, but as there existed a probability that this 11-12% of the sample were those who were worst affected by any exposure, I planned to use worst case scenario (and best case scenario) analysis in the sensitivity analysis for any outcome or covariate with >6% missing data, to determine whether the associations remained unchanged. This was to explore whether my findings were robust to simulations of the biases introduced by data MNAR (such as those respondents worst or least affected by a death having dropped out) using worst/best case imputed values for missing data on all outcomes and key covariates. If the adjusted risks were unchanged under these scenarios, this would indicate that the missing data had not resulted in an under- or over-estimation of the risk. If the findings were not robust to these scenarios, the plan was to proceed to multiple imputation on key covariates (296;297), to see whether adjusted odds ratios and coefficients using imputed values were similar to the main findings.

3.18 Analysis plan

3.18.1 Statistical approach

Respondents were divided into three groups on the basis of the exposure definition and inclusion criteria above. This categorised participants into those who had experienced the bereavement of a close friend or relative since the age of 10 by: 1) sudden natural causes; 2) sudden unnatural causes; or 3) suicide.

Multivariable analysis was used to estimate the strength of the associations between suicide bereavement and 10 outcome measures after taking into account potential confounders, identified as described below.

- Logistic regression was used to test the effect of mode of sudden death exposure on binary measures (post-loss suicidal ideation, post-loss suicide attempts, poor current social functioning, post-loss non-suicidal self-harm, post-loss drop-out from work or education, post-loss incident depression).
- Linear regression was used to test the effect of exposure on continuous measures (self-perceived stigma and shame).
- Ordinal logistic regression was used to test the association between mode of sudden bereavement exposure and risk of highest scores for tertile measures (guilt and responsibility).

Two analyses were conducted for each outcome measure, each in relation to a different reference category:

- The group bereaved by suicide (and the group bereaved by sudden unnatural causes) was compared with a baseline group of people bereaved by sudden natural causes to control for the sudden or unexpected nature of the death.
- The group bereaved by suicide (and the group bereaved by sudden natural causes) was compared with a baseline group of people bereaved by sudden unnatural causes, to control for the violent nature of the death.

This approach of direct comparison was chosen to answer a clinical question about risk of suicide attempt in an individual bereaved by suicide compared directly with an individual bereaved by sudden natural causes, or to an individual bereaved by

sudden unnatural causes. I wished to control for the sudden nature of the death and for the violence of the death. Clinically, direct comparisons of the odds of suicidality would be more easily interpretable than comparisons to an average effect.

The threshold for statistical significance was set at a p-value of p=0.05 for primary outcomes, but at a more stringent threshold of p=0.01 for secondary outcomes to compensate for multiple testing.

All analyses were conducted using Stata version 10, 11 or 12 (Stata Corp, College Station, Texas, USA).

3.18.2 Clustering

I introduced a correction for clustering by institution (n=37 HEIs), to reduce the chances of reporting significance where none exists (298). I investigated the effect of clustering at the HEI level using a random effects model to allow the average response to vary randomly between clusters.

3.18.3 Descriptive analysis

I explored response/completion rates through each stage of the questionnaire by univariable analysis for each key variable. Exposure groups were described by key socio-demographic (e.g. age, gender, work status, sick leave in last year, socioeconomic status, ethnicity, religion, marital status, number of children, social support) and clinical (e.g. past psychiatric history, personality disorder) variables, as well as variables relating to the kinship (e.g. kinship, time since bereavement).

3.18.4 Potential covariates for final model

I wished to identify key covariates for the final model *a priori* and used the literature and clinical judgement to establish variables likely to be confounders (i.e. those associated with both exposure and outcomes). Covariates I considered were:

- age (62) (299)
- gender (193;300)
- socio-economic status (56;71)

- marital status (193)
- past psychological problems (71;100;301)
- depressive symptoms, which are associated with self-harm in adolescents (302) and adults (303)
- pre-loss suicide attempt, which predicts post-loss suicidal ideation among those bereaved by suicide (164)
- past self-harm (suicidal and non-suicidal), which is associated with repeated self-harm in adults (304;305)
- non-suicidal self-harm, which is associated with suicidal ideation in adolescents (302)
- family history of mental illness (28)
- family history of suicide (in addition to the index bereavement) (54;56) (28;70;193-197;306)
- personality disorder (307)
- kinship to the deceased (162-164;308)
- closeness to the deceased (166;167;309)
- time since bereavement (30;164;310)

With an event rate for suicide attempt of 210/3,442 (6.1%) the selection of a maximum of 20 explanatory variables was indicated, selecting those not highly correlated with each other (311). However a more parsimonious model was preferred for the purposes of risk prediction using limited variables. For any clinical variables it was important that only pre-loss psychopathology was captured.

Tests for collinearity, using 5% as the threshold for significance, demonstrated that most of the main socio-demographic and clinical variables were weakly positively correlated (e.g. r=0.15 for personality disorder and previous suicidal and non-suicidal self-harm). Three bereavement-related covariates of particular interest were weakly collinear: closeness to the deceased, time since bereavement, and kinship to the deceased.

- closeness & time since death: r=0.07
- closeness & kinship: r=0.15
- kinship & time since death: r=0.05

There were group differences on all three of these measures. Respondents bereaved by suicide were less likely than those bereaved by natural causes to rate themselves as close to the deceased, to have been bereaved recently, and to have been related to the deceased ($p=<0.001$ for all three associations).

Particular discussion focused on whether closeness was a potential confounder, interaction term, or reflected recall bias or response bias. People who die by suicide may form weaker social ties. As a **confounder**, those who were less close to the deceased may have been less likely to have received support, as reflected in the results of my preliminary qualitative study, and therefore to have worse outcomes. Those who were less close to the deceased might also have differentially classified the death as a suicide. As an **interaction term**, the closeness of the relationship may have affected the nature of the exposure. **Recall bias** was possible in that a sense of rejection or stigma following suicide might have reduced respondents' recall of closeness. **Response bias** was possible in that the particular horror of suicide may have lowered the 'closeness' threshold for responding, such that suicide-bereaved individuals responded even when they had not known the deceased particularly well.

After discussions with my supervisors, seminar participants, and mental health researchers reviewing my conference poster presentations (see Appendix 1), it was felt that of the bereavement-related variables, kinship and time since bereavement were important covariates to include in the final model. As predictor variables for use in clinical settings these were also easy to define.

The following set of covariates was chosen *a priori* for the final model:

- Socio-demographic variables: age, gender, socio-economic status (using ONS classification collapsed into 5 categories)
- Clinical variables: pre-loss depression, pre-loss (suicidal and non-suicidal) self-harm, family history of suicide (additional to index bereavement)
- Bereavement variables: time since bereavement, kinship to the deceased

Age and time since bereavement were used as continuous variables (see Appendix 10) in preference to dichotomising at the median. This was to preserve statistical

power and variability, and to reduce the risk that a substantial part of the confounding would remain (294).

3.18.5 Multivariable analysis

I wished to avoid using stepwise variable selection approaches due to their disadvantages, and because I wished to develop an explanatory model based on the underlying conceptual framework (311). Instead I selected the covariates as above, using block adjustment with different combinations to test the explanatory role of each. This answered a clinical question about the variables having most impact, thus identifying sub-groups at greatest risk. Thus Model 1 described unadjusted risks, and Models 2-7 were non-accumulative illustrations of the role of different combinations of variables. Only the model containing all pre-determined covariates (Model 8) was regarded as the final adjusted model.

- Model 1: unadjusted
- Model 2: adjusted for socio-demographic factors (age, gender, & SE status)
- Model 3: adjusted for socio-demographic factors & kinship to the deceased
- Model 4: adjusted for socio-demographic factors & family history of suicide
- Model 5: adjusted for socio-demographic factors & pre-loss depression
- Model 6: adjusted for socio-demographic factors & pre-loss self-harm (suicidal and non-suicidal)
- Model 7: adjusted for socio-demographic factors & time since bereavement
- Model 8: fully adjusted (all 8 covariates)

As the covariates were determined *a priori*, assessment of the model fit was not indicated, using Wald tests or otherwise (312).

3.18.6 Effect modification

To test a secondary hypothesis, that any associations would be equally strong in relatives and in non-relatives of the deceased, I stratified by kinship to the deceased (blood relative *versus* unrelated) to test for an interaction of kinship with exposure. For this I used a p-value threshold of p=0.05, acknowledging the limited power of interaction tests to detect such an effect (313) (314).

3.18.7 Potential explanatory variable

To test a further secondary hypothesis, that any associations between suicide bereavement and any non-GEQ outcomes might be explained by stigma, I added the variable stigma to the final model for each. This approach was predicated on stigma fulfilling the criteria for determining mediation as follows: a) that there must be a significant relationship between bereavement exposure and outcomes; b) that there must be a significant relationship between stigma and the outcomes, and c) that stigma must be a significant predictor of the outcome in an equation including both stigma and the exposure (315). In conducting this test I recognised that if stigma appeared to explain any associations, there remained the possibility that this was not the sole mechanism, and that some unknown confounder was associated with both stigma and the outcome (316).

3.19 Sensitivity analyses

To explore potential biases and limitations of the sampling method, I conducted the following sensitivity analyses to test whether the results remained robust (in terms of the direction of risk being unchanged) using different scenarios or inclusion criteria.

3.19.1 Missing data

I recoded missing data for each outcome measure under worst case and best case scenarios (317), recoding missing values as positive or negative respectively. I did the same for the two covariates used in the final model that had >6% missing data: family history of non-index suicide (7% missing) and pre-loss (suicidal and non-suicidal) self-harm (7% missing). As 95% of missing values were common to both these covariates, each scenario was run for both the recoded variables together. I ran the analysis under worst case and under best case scenarios for each outcome (using original covariates), and then repeated the analysis under worst case and under best case scenarios for key covariates (using the original outcomes).

3.19.2 Selection bias

I ran the analysis having excluded participants from the 10 HEIs that had used variations on the suggested sampling approach, for example by using a weekly news

digest email, advertising on the intranet, or sending the sampling email only to students. Some eligible adults in these HEIs may have not been aware of the study through not receiving a direct email inviting participation. This may have given rise to systematic differences between those responding via this method, and those in the other HEIs. Excluding them tested whether systematic differences in those who responded by each method would bias the findings in relation to primary outcomes.

3.19.3 Variable cluster size

As cluster sizes ranged from 3 to 364 (see Appendix 6b), the analysis was repeated by dropping all those HEIs with cluster sizes less than or equal to the median value of 21. This tested to see whether high variability in cluster size had affected the precision of the risk estimates.

3.19.4 Ineligible respondents

The bimodal age distribution of respondents, with a second peak at 38-40, was likely to be due to random variation, but presented a small possibility that some respondents were aged over 40 but had given an incorrect age (near the upper limit of 40) to facilitate participation. I repeated the analysis excluding n=74+98+132=304 respondents aged 38-40 to test whether their responses had biased the main findings in relation to primary outcomes.

3.20 Qualitative data analysis

3.20.1 Qualitative data collection

3.20.1.1 Online data

Qualitative responses to the 20 questions with free text responses were downloaded to .csv format, and imported into NVivo for thematic analysis.

3.20.1.2 Interview data

Almost a third of the sample volunteered for a face-to-face interview (30%; n=1,408/4,630). A sub-sample of interviewees was drawn from volunteers using a purposive maximum variation sampling strategy (318;319), to reflect socio-

demographic parameters, geographical location, relationship to deceased, age at bereavement, time since bereavement, and experience of bereavement (mode of death, extent of difficulties, and level of support received). Interviews were conducted at university or voluntary sector sites in Edinburgh, Cardiff, Belfast and London. Each interview lasted up to an hour, and was audio-recorded, having established informed consent at the start. I introduced myself as a research fellow to reduce the influence of interviewee perceptions on interactions (320), and interviewees were not necessarily aware that I was a mental health professional. However as a trainee psychiatrist, I was able to monitor the emotional state of each interviewee and respond appropriately. All participants were provided with a copy of the list of bereavement support services provided on the UCL Bereavement Study website (see Appendix 8), should this be required.

For the interviews I used a topic guide (see Appendix 11), developed using the results of the preliminary study (see 4.1.3), to explore the experiences of the bereaved in more detail, particularly self-directed stigma (diminished self-esteem and self-efficacy) and perceived stigmatising attitudes of others. Views were elicited on the impact of any support received after the death, any unmet needs for other interventions, and advice on how others should approach bereaved persons. A transcript of each interviewee's online survey response was used to anchor the interview, and as prompts for domains in the topic guide. After 27 interviews saturation was judged to have been reached; namely the point at which no new conceptual insights were emerging from the data, and where similar instances were found repeatedly. My 27 digitally-recorded interviews were transcribed into Word (partly by myself, to enhance familiarisation with the data) and uploaded into NVivo for thematic analysis.

3.20.2 Qualitative data analysis

Funding has been awarded for one year by a Guarantors of Brain Entry/Exit Fellowship 2014-2015 to analyse the online and interview qualitative data. The purpose of this is:

- to explore the theme of stigma to build a conceptual basis for the findings of the quantitative study
- to explore the views of a population of bereaved adults on the support they received post-bereavement, to determine which sources of support are perceived to be effective and acceptable by people bereaved by each cause of death
- to identify a set of interventions that might be suitable for a clinical trial.

Thematic analysis was chosen because it is more appropriate for identifying repeated patterns of meaning across an entire dataset rather than within a data item (e.g. individual interview) (293). The aim is to use an inductive (bottom-up) approach rather than a theoretical or deductive ('top down') approach to minimise the influence of the researcher's theoretical interests or preconceptions (293). The analysis plan is to use thorough coding of the transcript material and theme extraction, examining for patterns and deviancy within and across cases (321;322). Initial coding will be discussed with supervisors and collaborators in order to provide coding validation (323). A process of constant comparison will identify analytical categories from the data. Analytic induction will test and retest theoretical ideas using the organised data (323). Input from the supervisors in analysing these data will improve consistency and reliability of analyses, and allow an exploration of reflexivity (324), particularly in relation to how respondents/interviewees perceived me (e.g. as a researcher/psychiatrist/non-bereaved person). It will be possible to compare themes arising from separate analyses of the samples bereaved by suicide, sudden unnatural causes, and sudden natural death. This will provide valuable policy information on the overlap between the types of services preferred by people bereaved by suicide and those preferred by people bereaved suddenly due to other causes, with implications for economies of scale in service provision. The results will be shared with the consultation group to assess the degree to which these resonate with their own experiences, as a test of validity.

3.21 Follow-up study

At the end of the online questionnaire I invited respondents to provide contact details if interested in participating in an unspecified future study. This introduced scope to

follow-up the sample. In 2013, funded by a MRC Early Career Centenary Award, I conducted a survey of help-seeking behaviour in young people during episodes of suicidal crisis. The results are not reported in this thesis but the methods are described briefly. I emailed the sub-sample of n=1,107 who had consented to follow-up, provided a valid email address, and reported any history of suicidality or non-suicidal self-harm defined using APMS criteria (274;275). I invited those with any lifetime history of suicidal ideation or suicide attempt (excluding non-suicidal self-harm) to participate in a further online survey questionnaire. The questionnaire asked respondents to describe the sources of help they had used during any episodes of lifetime suicidal ideation or suicide attempt, categorised by their age-group at that time, and their views on the helpfulness of each source of support used during each episode. Due to the retrospective nature of the study, episodes of non-suicidal self-harm were excluded because of the difficulties in distinguishing between help-seeking for suicidality and for non-suicidal self-harm within each age band. I also sought participants' reasons for not using other sources of help, using a measure of barriers to service use, adapted from the standardised instrument used in the World Health Organization World Mental Health surveys (325). A total of n=266 respondents satisfied inclusion criteria, and the results will be analysed during my post-doctoral fellowship.

Chapter 4 Results

4.1 Results of preliminary qualitative study of bereaved adults

4.1.1 Recruitment

From January 2010 to April 2010, 36 bereaved adults responded to the invitation to participate in a survey of people bereaved by suicide, sudden natural causes, and sudden unnatural causes, as advertised on the websites of Cruse Bereavement Care and Samaritans. Of the 36 responses to this pilot study, 30 had accessed the online questionnaire via the Cruse Bereavement Care website and 6 via the Samaritans website. As this was an open survey no denominator or response rate could be derived. The sample were assumed to reflect those who had accessed, or were considering accessing help, as reflected by their use of support services webpages. It was apparent from responses that 5 respondents from the Cruse sample had become Cruse volunteers after their bereavement, although this was not probed directly.

4.1.2 Participant characteristics

The mean age of respondents was 43.6 years (range 21-66), and the mean length of time since their bereavement was 11 years (range 3 months to 37 years). Bereavement exposure was as follows: n=29 bereaved by sudden natural causes, n=14 by sudden unnatural causes, n=5 bereaved by suicide, and n=2 unspecified. These figures indicate some overlap between exposures, such that n=3 (8%) had experienced all three types of bereavement, n=8 (22%) had experienced any two types, and n=23 (64%) had experienced only one type. All 5 of those bereaved by suicide had experienced bereavements by other causes of sudden death, and all 5 were recruited via Cruse.

4.1.3 Results of thematic analysis

Using the process of thematic analysis, four key themes were identified:

- negative or stigmatising attitudes
- avoidance of the bereaved person and the topic of the death
- concealment of grief after a sudden bereavement

- lesser support for outer circle of bereaved people.

These themes are described below, illustrated using quotes from respondents.

4.1.3.1 Theme 1: Negative or stigmatising attitudes

The negative attitudes of other people appeared to relate either to blaming the deceased for the sudden or shocking nature of their death, or to the bereaved in relation to their profound grief. One example of negative attitudes towards the deceased was described by a 43 year old whose sister had killed herself at a train station:

> "I politely asked one of the station staff if they could point out exactly where 'the unfortunate business last week' happened. He made some suggestion at first that the person who did it was clearly 'off her head' or words to that effect, and thoughtless and inconsiderate. When he asked why I was asking and I said 'she was my sister' he made some comment such as 'oh no, not your sister, I can't believe your sister would do something like that, it must have been somebody else'".

Negative attitudes were also apparent within press coverage of the death. A 58 year old whose husband had died 2 years previously from accidental drowning explained:

> "(The press were) OK until the inquest and then it was a bit sensational; there was a lot of publicity when he died and most of it was positive until the inquest when comments were made in newspapers which were negative".

Responses also described negative attitudes towards the bereaved, suggestive of a stigma associated with grieving a sudden or violent death. This was expressed by a 56 year old ex-social worker who had experienced multiple sudden bereavements, including maternal sudden natural death, the suicide of a close friend, and the suicide of a client:

> "I'm labelled through my response to (my grief) - depressed, suicidal, no hoper and that hurts most of all." "The pain and the shock of bereavement is only increased by thoughtless prejudices that seem more cruel than the

death". "I wanted to be seen as wounded, lost, bereaved, not hopeless/stigmatised."

4.1.3.2 Theme 2: Avoidance of the bereaved person and the topic of the death

Respondents gave repeated examples of:

- other people avoiding the bereaved person
- other people avoiding the subject of the death
- the bereaved avoiding the subject of the death.

Bereaved people described their disappointment at the lack of support or contact from some of their close friends. A 41 year old whose partner had died suddenly of natural causes within the previous year said that they hadn't "heard from most people I would have classed as close friends" and felt "terribly let down" by them for not offering any support. A 61 year old had also been widowed within the past year due to accidental death explained: "the majority of friends are closer than ever but two seem to have drifted away."

Even where contact with friends had been maintained, conversations had tended to avoid the subject of the deceased person or how they had died. For example a 58 year old whose husband had died two years previously of accidental drowning explained "some people do avoid talking about him or are uncomfortable when the conversation focuses on him". A 56 year old ex-social worker who had experienced multiple sudden bereavements commented "people… cannot think of things to say and thus avoid the family or the bereaved".

Respondents also described how they themselves had avoided discussing the death for a variety of reasons:

- to avoid negative attitudes in others
- to avoid upsetting other relatives and friends of the deceased
- to avoid becoming upset themselves.

A 30 year old whose close friend had died 8 years previously by suicide explained: "myself, friends, family and colleagues occasionally talk about the friend; it's never about their death. Rather activities they were involved in while alive".

Respondents also described the various approaches they took when other people avoided talking about the death. Some colluded by also avoiding the topic. Others challenged the avoidance by raising the topic themselves, even when aware this might shock a conversation into silence. One suggested solution to the issue of avoidance was to encourage openness. A 56 year old who had experienced multiple sudden bereavements explained: "I encourage people to discuss their pain/grief openly – the Brits are v bad at helping people grieve – I see it as natural that we do."

4.1.3.3 Theme 3: Concealment of grief

Many respondents described the extent to which they had concealed their grief following the death, and their reasons for this. A 48 year old whose father had died suddenly of natural causes four years previously explained: "I feel I have to tread on egg shells around some people and can't show the full extent of my grief". The main reasons given for concealing grief were that:

- being open about grief tended to cause problems
- being open about grief didn't bring about many advantages
- hiding one's grief appeared to offer some advantages

In relation to the last of these, a 61 year old who had been widowed 7 months previously due to accidental death explained: "I find people more sympathetic if I put on a brave face".

4.1.3.4 Theme 4: Lesser support for outer circle of bereaved people

The fourth theme identified was that of reduced support available to those in the deceased person's outer circle compared with that available to those in the inner circle of close relatives and close friends (see Figure 4-1: Relationship between kinship network and availability of support). These more peripheral members of the network included 2nd and 3rd degree relatives, colleagues, clients, fellow students, ex-partners, and relatively new partners. Those particularly affected were 'hidden'

contacts (1): friends unknown to others in the deceased person's circle, and secret relationships. The perceived reduction in the availability of formal and informal support appeared to relate to:

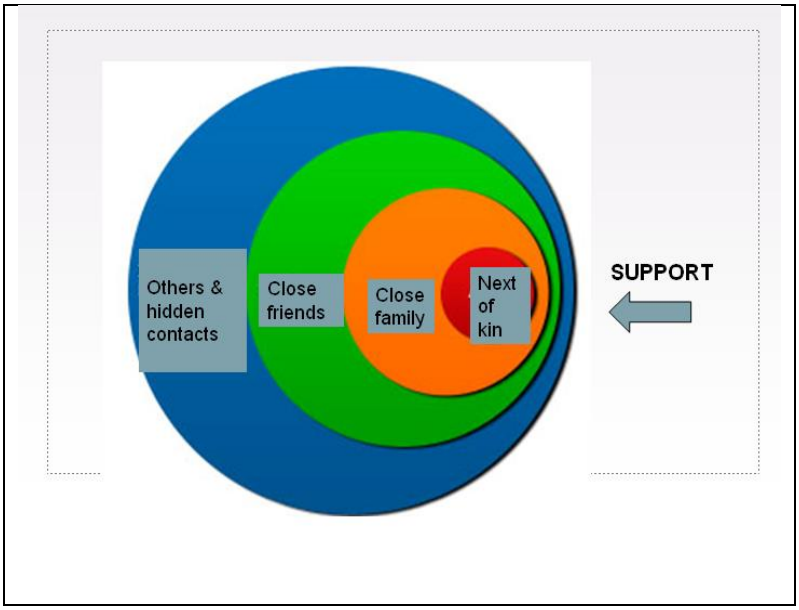
- those in outer circles perceiving themselves as less worthy of support
- others perceiving those in outer circles as less in need of support.

Together these factors appeared to result in the outer members of a network seeking help less often and being offered help less often than the inner circle of bereaved. This appeared to apply even if more distant members experienced high levels of grief; identifying an unmet need for support.

A 30 year old whose close friend had died 8 years previously by suicide explained: "Support is understandably directed first and foremost at the family. However if…there has been a family fallout, and the person is heavily emotionally dependent on their friends in the lead up to the incident, then I think these people deserve more recognition from support services. I would have liked the family to make services aware of us and our grief, as they certainly were aware of this, but I don't think they did. Perhaps it was up to us to be more proactive and seek help? Or perhaps there aren't the same provisions for non-relatives?"

A 22 year old whose father had died 2 years previously of unnatural causes noticed "my older cousin of around 30 needed more help but I think she felt that she was not close enough to my father for people to understand. This and other factors led to her having depression. So I understand how important it is to ask for help when you need it".

Figure 4-1: Relationship between kinship network and availability of support



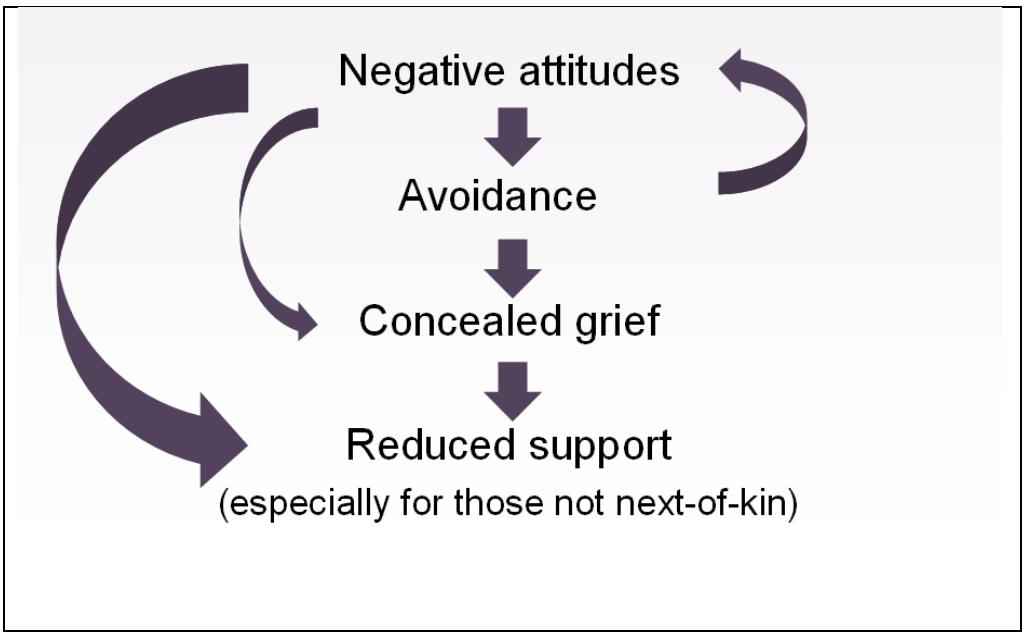
Some of the less central members of the network were comfortable with the nearest relative being the focus of support. A 22 year old whose father had died 2 years previously from unnatural causes explained "my mother got support from Cruse and helped me and my brother when we felt down. I didn't really want support from anyone else as I believe I handled my father's death well". However, sometimes this kinship hierarchy meant that a bereaved person had to put their own grief on hold whilst supporting someone closer to the deceased. A 46 year old whose father had died 3 years previously of natural causes explained: "(My partner and I) have had to act as carers for my mother who suffers from depression and at present is unable to be left alone. (My cousins) all offer to help but my mother only wants myself or my brother". Together these examples highlight the need for every member of a deceased person's network to have access to support if required.

4.1.3.5 Links between themes

The schematic representation below (see Figure 4-2: Links between the four qualitative themes) uses the four themes to suggest how societal attitudes towards those who are bereaved suddenly might impact on the availability of support. This does not take account of demand-side factors (such as personality traits, coping style, pre-existing levels of support, or preferences for help-seeking) but focuses on

supply-side factors and how a societal discomfort in discussing death and confronting the bereaved (80) might diminish both help-seeking and help offered.

Figure 4-2: Links between the four qualitative themes



I hypothesised that the themes were linked as follows. A fear of something that is not understood might result in negative attitudes about certain kinds of sudden death, and a tendency to project this by denigrating or stigmatising the bereaved. Such fear and discomfort might be the explanation for avoiding the bereaved person, steering clear of the subject of the death, and concealing one's own grief to smooth social interactions. In situations where the bereaved avoid talking about the death and conceal their grief it might be less evident that they are in need of support, particularly without next-of-kin status. A 21 year old, whose close friend had died due to accidental death 5 years previously, observed: "I think support could have been provided if we showed 'enough' emotion/distress but I hid the grief and decided to move schools". Similarly a 30 year old, whose close friend had died 8 years previously by suicide, reflected: "I tend to put on a brave face after the initial tears so perhaps that's why no-one has brought (the idea of help) up again since it happened".

4.1.4 Validity of findings

The themes were presented for discussion at 5 seminars during 2010:

- Two conferences attended by bereavement counsellors and bereaved people:
    - Barts and the London Bereavement Conference (18/6/10)
    - Survivors of Bereavement by Suicide Support Day (19/6/10)
- Two clinical meetings of mental health professionals:
    - Camden Social Workers Mental Health and Child Care Lunchtime Workshop (18/11/10)
    - Camden Joint Management Meeting Adult Mental Health and Family Services and Social Work (25/11/10)
- UCL Division of Psychiatry seminar (3/9/10)

These discussions validated my findings by testing whether participants felt that the themes identified resonated with their own experiences. The feedback indicated that the themes appeared to reflect the experiences of other bereaved people, with numerous examples offered by participants of their own experiences of hurtful attitudes, social awkwardness, masking grief, and difficulties accessing support.

The results of this preliminary qualitative study will be a useful comparison with the results of thematic analysis of the online and interview qualitative data. The implications of this preliminary study are explored in the first part of the Discussion chapter.

4.2 Results of national survey of young adults at HEIs

4.2.1 Recruitment of HEIs

Of the 164 HEIs approached, 37 consented to participate in the study, representing a response of 23%. Appendix 6a shows the responses of all 164 HEIs. Responses varied by devolved nation, with the highest response seen in Northern Ireland (50%) and the lowest in Wales (18%). Thus, of the 130 HEIs in England, 61 did not respond, 40 refused, and 29 consented to take part (response=22%). Of the 19 HEIs in Scotland, 10 did not respond, 5 refused, and 4 consented to take part (response=21%). Of the 11 HEIs in Wales, 7 did not respond, 2 refused, and 2 consented to take part (response=18%). Of the 4 HEIs in Northern Ireland, 2 did not respond, and 2 consented to take part (response=50%).

Responses also varied by membership of the Russell Group of universities. At the time of conducting the survey in 2010 there were 20 Russell Group universities, representing 12% of UK HEIs (20/164). From 2012 their membership rose to 24, representing 15% of UK HEIs (24/164). At the time of the study, one fifth (8/37; 22%) of the participating HEIs were Russell Group universities, denoted by bold type in Appendix 6a. The response from Russell Group universities was 40% (8/20) and from non-Russell Group universities was 20% (29/144). If using 2012 membership status, the overall response from Russell Group universities would have been 33% (8/24) and that from non-Russell Group universities would have been 21% (29/140).

4.2.2 Recruitment of individual participants

A total of 5,085 people, from the sampling frame of 659,572 people, responded to the questionnaire by clicking on the survey link. Bereavement exposure was as follows: n=2,267 bereaved by sudden natural causes, n=761 by sudden unnatural causes, n=658 bereaved by suicide, n=1,399 exposure missing. Overall responses ranged from 0.2% (SOAS) to 2.6% (Queen's University Belfast) in HEIs sending an individual email to all staff and students, and from 0.1% (Heriot Watt University) to 4.4% (University of Oxford) for HEIs using variations on this recruitment method (see Appendix 6b: Table of Responses by HEI). As there was no reliable way of

measuring the denominator of those bereaved due to any cause of sudden death, an accurate response cannot be calculated. However in my sample size calculation (described in the Method chapter) I had estimated that 5,046 people in the HEI sample had been bereaved by suicide. This suggests that 13% (658/5046) of people bereaved by suicide responded, which was within the 10-20% response predicted.

Participant flow is shown in Figure 4-3: Participant flow through the UCL Bereavement Study, indicating that 91% (n=4,630) of those responding to the questionnaire consented to participate, with the remaining 8% producing essentially blank questionnaires. These were presumed to be from people who may or may not have been eligible to participate, but who had opened the questionnaire to review its contents, but proceeded no further. Indeed it is possible that some opened the questionnaire out of curiosity or some other motive, but without the intention of completing any part.

Of the 4,630 consenting to take part, the participants satisfying inclusion/exclusion criteria were as follows:

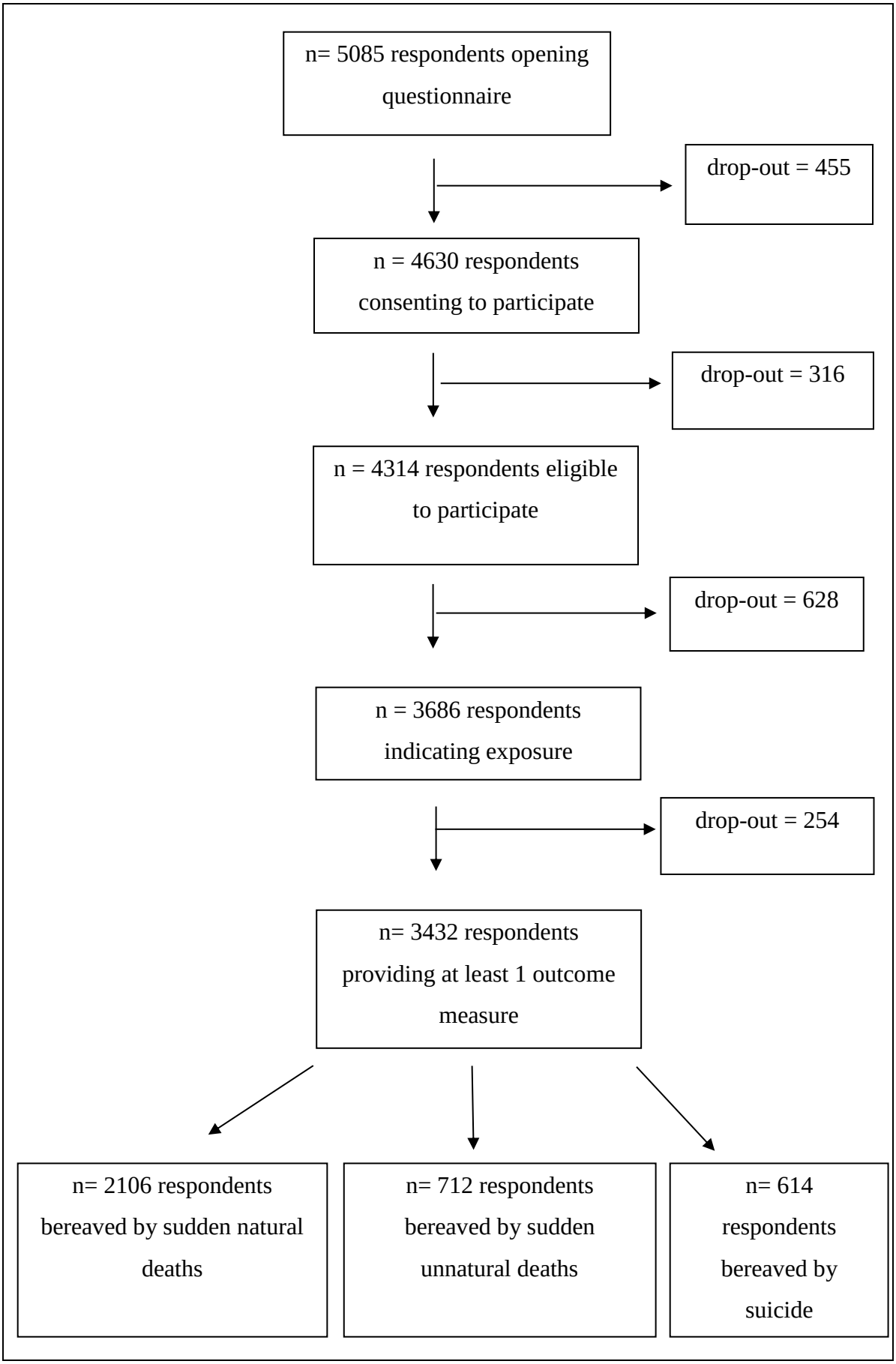
- 93% (n=4,314) gave their current age as between 18 and 40 years
- 80% (n=3,686) specified what type of sudden bereavement they had been exposed to since the age of 10
- 74% (n=3,432) of respondents completed at least one outcome measure

Using the exposure definitions described in the Methods chapter, the 3,432 eligible to participate were classified into three groups:

- n= 614 respondents bereaved by suicide (18% of sample)
- n= 2106 respondents bereaved by sudden natural causes of death (61% of sample)
- n= 712 respondents bereaved by sudden unnatural causes of death (21% of sample)

These group sizes exceeded the minimum of 466 participants required per group for two-sided analysis to achieve adequate power at the p=0.05 level of significance.

Figure 4-3: Participant flow through the UCL Bereavement Study



4.2.3 Assessment of response bias in questionnaire completion

To check for evidence of response bias within the wider sample of all those consenting to participate, I conducted chi-squared (χ^2) tests for differences between those who had completed the questionnaire and whose who had not. Completion was defined as having provided at least one of the 10 outcome measures, usually by reaching the GEQ (question 63 out of 120 quantitative questions). These tests showed that of all those consenting to participate (n=4,630), there were no differences between eligible individuals completing (n=3,432) and those not completing the survey (n=1,198) in relation to social class (p=0.908), type of bereavement (p=0.802), or time since bereavement dichotomised at the 2 year mark (p=0.164). It was not possible to test for evidence of response bias in relation to clinical and psychosocial variables, because some outcome measures were collected prior to descriptive clinical and psychosocial variables. This ordering positioned the more sensitive questions on psychiatric history and functioning at the end of the questionnaire to reduce the risk of drop-out. However the trade-off from reducing missing data on outcome measures was that I was unable to test for evidence of response bias in relation to: family history of suicide; family history of psychological problems; past history of psychological problems; past history of suicidal thoughts; past history of suicide attempts; past history of non-suicidal self-harm; lifetime history of depression; or probable personality disorder.

I did find evidence of response bias in relation to specific socio-demographic characteristics of the respondents and of the deceased. Significant differences were apparent between completers and non-completers in relation to:

- gender, with females significantly more likely to complete than males (81% *versus* 69%; p<0.001)
- age, with completers more likely to be older as demonstrated by a difference in mean ages of borderline significance (p=0.046) between completers (mean=25.0; SD=6.3) and non-completers (mean=24.5; SD=6.3); and when using tertiles, those aged 26-40 and those aged 22-25 were significantly more likely to complete than those aged 18-21 (82% *versus* 81% *versus* 78%; p=0.015)

- educational attainment, with those educated to degree level significantly more likely to complete than those educated up to A level (87% *versus* 84%; p=0.007)
- ethnicity, with those from White groups significantly more likely to complete than those from non-White ethnic groups (88% *versus* 75%; p<0.001)
- sickness absence record, with completers having a significantly shorter mean sickness absence in the last year than non-completers (mean=11.8; SD=35.3 *versus* mean=9.1; SD=21.2; p=0.006)
- kinship to the deceased, with those who were a blood relative of the deceased significantly more likely to complete than those unrelated to the deceased (96% *versus* 93%; p=0.001)
- closeness to the deceased, with those who rated themselves as very close to the deceased significantly more likely to complete than those who rated themselves as quite close to the deceased (97% *versus* 94%; p<0.001)
- frequency of contact with the deceased, with those who reported having been in contact with the deceased at least weekly in the year prior to their death significantly more likely to complete than those who had less than weekly contact (96% *versus* 94%; p<0.001)
- social support, with those perceiving themselves as having good social support significantly more likely to complete than those perceiving a severe lack of social support (92% *versus*. 85%; p<0.001)

There were no significant differences between completers and non-completers in relation to staff/student status, age at bereavement (aged under 18 *versus* aged over 18), or the age of the deceased (aged under 18 *versus* aged over 18).

4.2.4 Exposures to differing modes of bereavement within eligible sample

The Venn diagram that follows (Figure 4-4: Venn diagram showing the combinations of exposures in eligible sample) shows all the combinations of sudden bereavements to which eligible participants had been exposed. The majority (n=2831; 83%) had been exposed to only one type of sudden bereavement, and a minority (n=513; 15%) had been bereaved by any two of the types of sudden bereavement. A small minority

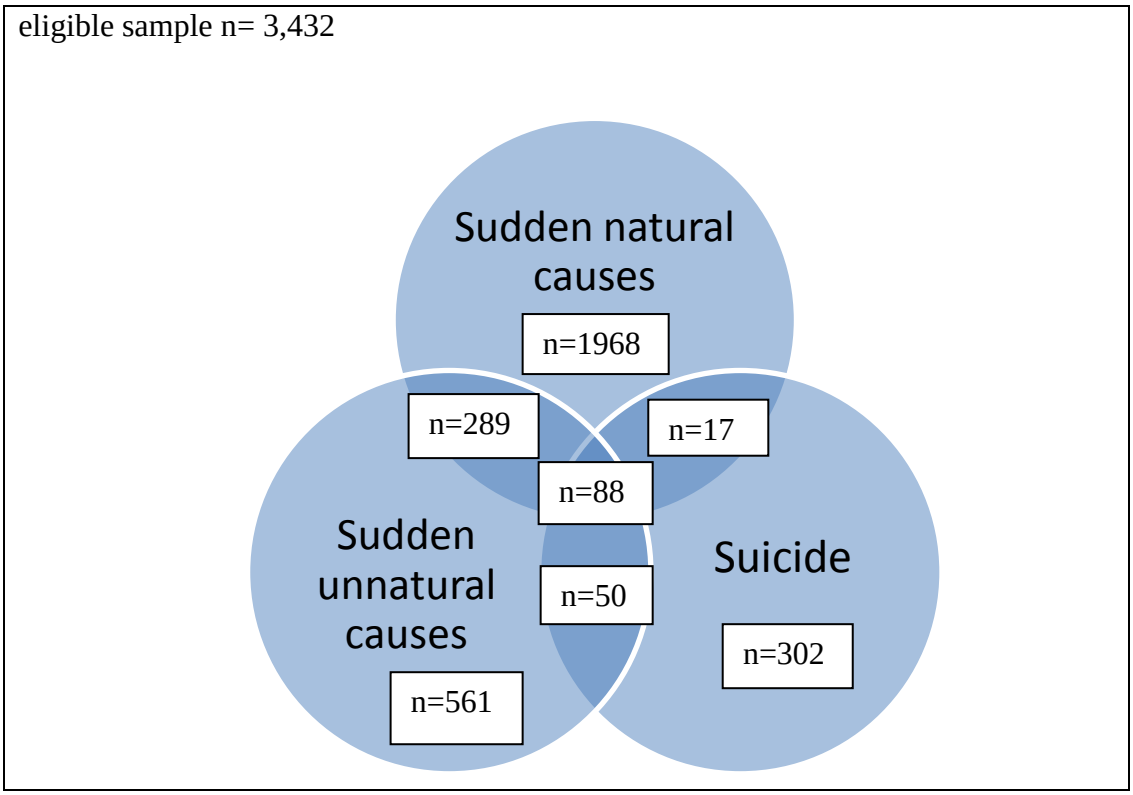
(n=88; 3%) had been exposed to all three types of sudden bereavement, representing 14% of the group bereaved by suicide.

Chi-squared (χ^2) tests for differences between proportions showed that of the total eligible sample of n=3,432:

- those exposed to only one type of sudden bereavement were significantly more likely to have been exposed to bereavement by sudden natural causes (70%) than to that by sudden unnatural causes (20%) or suicide (11%; $p<0.001$)
- those exposed to bereavement by both sudden natural causes and sudden unnatural causes were significantly more likely to choose to relate their responses to someone who had died by sudden unnatural causes (52% *versus* 48%; $p<0.001$).

As I did not collect data on the numbers of each type of sudden bereavement that participants had experienced, it was not possible to be more specific than this in measuring dose of bereavement.

Figure 4-4: Venn diagram showing the combinations of exposures in eligible sample



4.2.5 Missing data as an indicator of response bias

Within the eligible sample of n=3,432 I examined distribution of missing values by key socio-demographic variables, to assess potential for bias, particularly in relation to the primary outcomes (suicidal ideation and attempt).

Males were significantly more likely to have missing data when reporting psychopathology (any past history of depression, other psychological problems, any suicidal thoughts, suicide attempts, or non-suicidal self-harm) than females (9% *versus* 6%; p=0.003), suggesting a pattern of data missing at random (MAR).

Respondents in social classes 1 & 2 were significantly more likely to have missing data when reporting psychopathology than those in social classes 3-7 and 9 (7% *versus* 5%; p=0.033), suggesting a pattern of data missing not at random (MNAR).

People with a family history of suicide were significantly more likely to have missing data when reporting psychopathology than those without a family history (3% *versus* 1%; p=0.049). Although this was of marginal significance it also suggested a pattern of data MNAR. Respondents with missing data on past psychiatric history were significantly more likely than those with complete data to have better outcomes (in relation to incident suicidal ideation, non-suicidal self-harm, depression, stigma, shame, responsibility, guilt) or were no different in outcomes (for incident suicide attempt, social functioning, or drop-out from work/education). This suggests either that data were missing because no history was present, or that those with worst outcomes were more likely to respond with complete data; a non-response bias on past psychiatric history from those least badly affected in relation to the bereavement.

Among the eligible sample of those completing at least one outcome measure (n=3,432) I used scores on the first outcome measure featured in the survey (GEQ stigma subscale), dichotomised at the median, to test whether high scores predicted subsequent drop-out. This showed that there were no differences between those with high or low stigma scores in their likelihood of completing any primary outcomes, or of completing at least half of the 10 total outcomes.

I also used scores on the sixth outcome measure featured in the survey (Social Functioning Questionnaire) to test whether social dysfunction predicted subsequent drop-out, confirming that those with poor social functioning were significantly less likely ($p<0.001$) to complete the subsequent primary outcomes (suicidal ideation; suicide attempt) and secondary outcomes (non-suicidal self-harm; drop-out from work or education) than those with good social functioning. Those with poor social functioning were also significantly less likely ($p<0.001$) to complete the preceding secondary outcomes (depression; stigma; shame; responsibility; guilt) than those with good social functioning.

I tested for evidence of response bias in relation to whether type of exposure within the eligible sample (n=3,432) predicted completion. This showed that mode of bereavement was not associated with the number of primary outcomes completed ($p=0.651$), the number of total outcome measures completed ($p=0.791$), or whether any primary outcomes were completed ($p=0.302$).

4.2.6 Extent of missing data for key covariates and outcomes

There were low levels of missing data for the 8 covariates used in the final model. Proportions of respondents with missing data for each variable were as follows, in rank ascending order: 0% for age, 0% for time since bereavement, 0% for gender, 0.4% for kinship, 3.2% for social class, 3.8% for pre-loss depression, 7.0% for pre-loss (suicidal & non-suicidal) self-harm, and 7.0% for family history of (non-index) suicide.

The table that follows (see Table 4-1: Extent of missing data on key variables by exposure group) presents the extent of missing data for these covariates and outcome measures, broken down by exposure.

The proportion of missing values for the 10 outcome measures was as follows: 6.6% for suicidal thoughts, 6.8% for suicide attempt, 6.5% for social functioning, 6.8% for post-bereavement non-suicidal self-harm, 6.4% for post-bereavement dropout from work, 3.8% for post-bereavement incident depression, 1.3% for stigma, 4.2% for shame, 2.6% for responsibility, and 2.9% for guilt.

Table 4-1: Extent of missing data on key variables by exposure group

Sample	**SND**	**SUD**	**suicide**	**Total**
Full eligible sample	n=2106	n=712	n=614	n=3,432
Complete data on all covariates	1884 (90%)	633 (89%)	553 (90%)	3070 (89%)
Complete data on all covariates & on each primary outcome				
post-bereavement suicidal ideation	1883 (89%)	633 (89%)	552 (90%)	3068 (89%)
post-bereavement suicide attempt	1883 (89%)	633 (89%)	553 (90%)	3069 (89%)
Complete data on all covariates & on each secondary outcome				
current social functioning	1879 (89%)	628 (88%)	545 (89%)	3052 (89%)
post-bereavement non-suicidal self-harm	1883 (89%)	633 (89%)	553 (90%)	3069 (89%)
post-bereavement dropout from work / education	1879 (89%)	631 (89%)	551 (90%)	3061 (89%)
post-bereavement depression	1884 (90%)	633 (89%)	553 (90%)	3070 (89%)
stigma	1860 (88%)	628 (88%)	548 (89%)	3036 (89%)
shame	1859 (88%)	625 (88%)	548 (89%)	3032 (88%)
responsibility	1876 (89%)	629 (88%)	552 (90%)	3057 (89%)
guilt	1872 (89%)	626 (88%)	548 (89%)	3046 (89%)

(Key: SND = sudden natural death; SUD = sudden unnatural death)

4.2.7 Participant characteristics

The characteristics of those participants who fulfilled inclusion criteria (n=3,432) are described below, categorised by mode of bereavement. Chi-squared (χ^2) tests for differences between proportions were used to identify any group differences on covariates that might confound an estimation of risks.

4.2.7.1 Socio-demographic characteristics

In the sample as a whole there was a male:female ratio of 1:4, and this ratio did not differ significantly between different age groups (p=0.371). Socio-demographic characteristics by bereavement exposure are tabulated below (see Table 4-2: Table showing sample socio-demographic characteristics). There were no significant differences between the exposure groups in relation to mean age or gender. Given the skewed distribution for age (see Appendix 10), groups were compared using the continuous variable age divided into tertiles (to yield values of 18-21, 22-25, and 26 to 40). Chi-squared tests showed no significant differences in age groups between the exposure groups, but a non-significant trend towards younger respondents being more likely to have been bereaved by sudden natural causes (p=0.057).

The bimodal distribution of age, with a slight second peak at age 38-40, had suggested that some participants may have been aged over 40, but had given a false age in order to take part. Testing to see if the sub-group aged 38-40 differed in their risk of primary outcomes showed that their risks of post-bereavement suicidal ideation (p=0.365) and of post-bereavement suicide attempt (p=0.843) were no different to those for the sub-group aged 19-37. Nevertheless, because of the unusual age distribution I ran a sensitivity analysis excluding those aged 38-40 to see if the findings remained unchanged (see 4.2.12.4).

There were no significant differences between exposure groups in relation to ethnicity, with 90% of the eligible sample describing White (White British, White Irish, Other White groups) ethnicity. This indicated a slight over-representation of White respondents in comparison with England and Wales census data for 2011 (326), which showed that White groups comprised 86% of the population.

Table 4-2: Table showing sample socio-demographic characteristics

Participants bereaved by:	SND	SUD	suicide	Total	p-value
	(n=2106)	(n=712)	(n=614)	(n=3432)	
(* = p<0.05)					
Characteristic					
Gender †					
male	396	136	115	647	
%	18.8	19.1	18.7	18.9	
female	1,709	576	499	2,784	
%	81.0	80.9	81.3	81.0	
missing	1	0	0	1	
%	0.1	0.0	0.0	0.0	0.955
Age of respondent (continuous) †					
mean	24.9	25.2	25.2	25.0	
(SD)	6.3	6.3	6.0	6.3	0.069
Age of respondent (categorical)					
age 18-21	894	274	224	1,392	
%	42.5	38.5	36.5	41	
age 22-25	510	193	168	871	
%	24.0	27.1	27.4	25.0	
age 25-40	702	245	222	1,169	
%	33.0	34.4	36.2	34.0	
missing	0	0	0	0	
%	0.0	0.0	0.0	0.0	0.057
Ethnicity					
white	1,877	645	562	3,084	
%	89.0	90.6	91.5	90.0	
non-white	228	65	52	345	
%	10.8	9.1	8.5	10.1	
missing	1	2	0	3	
%	0.1	0.3	0.0	0.1	0.102
Socioeconomic status (binary)					
Social class 1 & 2	1,287	458	380	2,125	
%	61.1	64.3	61.9	61.9	
Social class 3 - 7 & 9	758	227	213	1,198	
%	36.0	31.9	34.7	34.9	
missing	61	27	21	109	
%	2.9	3.8	3.4	3.2	0.292
Socioeconomic status (5 categories) †					
social classes 1.1 & 1.2	603	224	176	1003	
%	28.6	31.5	28.7	29.2	
social class 2	684	234	204	1122	
%	32.5	32.9	33.2	32.7	
social class 3	259	77	68	404	
%	12.3	10.8	11.1	11.8	
social class 4	90	34	32	156	
%	4.3	4.8	5.2	4.6	
social classes 5,6,7 & 9	409	115	113	638	
%	19.4	16.3	18.4	18.6	
missing	61	27	21	109	
%	2.9	3.8	3.4	3.2	0.604

Participants bereaved by:	SND	SUD	suicide	Total	p-value
	(n=2106)	(n=712)	(n=614)	(n=3432)	
(* = p<0.05)					
Characteristic					
Educational status (binary)					
max A level	964	286	255	1,505	
%	46.0	40.2	41.5	44.0	
gained degree or above	1,136	424	359	1,919	
%	54.0	59.6	58.5	56.0	
missing	6	2	0	8	
%	0.3	0.3	0.0	0.2	**0.035***
Educational status (5 categories)					
no academic qualifications	2	2	0	4	
%	0.1	0.3	0.0	1.1	
gained max GCSE level	33	8	12	53	
%	1.6	1.1	2.0	1.5	
gained max A level	929	276	243	1,448	
%	44.1	38.8	39.6	42.2	
gained max undergrad degree level	763	266	217	1,246	
%	36.2	37.4	35.3	36.3	
gained max post-grad degree level	373	158	142	673	
%	17.7	22.2	23.1	19.6	
missing	6	2	0	8	
%	0.3	0.3	0.0	0.2	**0.021***
Student status					
student	1,797	613	526	2,936	
%	85.3	86.1	85.7	85.6	
staff	253	78	68	399	
%	12.0	11.0	11.1	11.6	
both	55	21	20	96	
%	2.6	3.0	3.3	2.8	
missing	1	0	0	1	
%	0.1	0.0	0.0	0.0	0.905
validated measure of social support					
no lack of perceived social support	1,234	411	345	1,990	
%	58.6	57.7	56.2	58.0	
moderate lack	549	197	168	914	
%	26.1	27.7	27.4	26.6	
severe lack of perceived social support	323	102	100	525	
%	15.3	14.3	16.3	15.3	
missing	0	2	1	3	
%	0.0	0.3	0.2	0.1	0.297

(**Key:** SND = sudden natural death; SUD = sudden unnatural death; † = variable used in the final model)

Just over half of the sample (58%) was derived from HEIs with Russell Group membership. The overall proportion of respondents from social classes 1 & 2 was 62%. There was a significant association between social classes 1 & 2 and Russell Group membership (p=<0.001). There were no significant differences between

exposure groups in relation to socioeconomic status, in a binary comparison of social classes 1 & 2 to social classes 3-7 and 9 (p=0.292), and this was the same whether considering the total sample, the student sub-sample (n=2936; 86%) or the staff sub-sample (n=495; 14%). Staff were significantly more likely to be from social classes 1 & 2 than were students (77% *versus* 62%; p=<0.001), but there were no differences between staff and students in relation to lifetime psychological problems (p=0.725) or lifetime depression (p=0.570).

There were no significant differences between exposure groups in relation to marital status, parental status, student/staff status, living status, work status, number of sick days in the last year, or three measures of social support: primary group size, regular contact with other people, or perceived social support.

The majority of the sample (56%) had been educated to undergraduate degree level or above. There were significant differences between exposure groups in relation to educational attainment, such that those bereaved by sudden unnatural causes were significantly more likely than the other groups to be educated to degree level and above (p=0.035). Tests for collinearity confirmed that educational status was moderately correlated (r=0.34) with age at the 5% level of significance. There were no significant differences between groups in relation to drop-out from work or education prior to the loss (p=0.263).

There were no significant differences between exposure groups in relation to whether respondents held religious beliefs or not, but when broken down by religious group those describing themselves as Catholic appeared to be significantly more likely to be have been bereaved by suicide or accidental death than by natural causes (p=0.003). Given the possibility that this might be explained by exposure to conflict in Northern Ireland this was explored in two sub-samples: the Northern Irish HEIs (n=2) and the English, Scottish and Welsh HEIs (n=35). In the Northern Irish sample there were no significant differences between groups in relation to religious group, but in the mainland sample there were significant differences (p=0.003), with a similar excess of violent bereavements among Catholics.

4.2.7.2 Clinical characteristics

The clinical characteristics of the sample are shown in the table that follows (see Table 4-3: Table showing sample clinical characteristics), tabulated by bereavement exposure.

In relation to familial risk, those bereaved by suicide were significantly more likely to have a family history of psychological problems (p=0.005). However, when stratifying by kinship this difference was only apparent in those bereaved by the suicide of a family member, suggesting an interaction with kinship. It was evident that those bereaved by suicide had a significantly increased risk of having a family history of suicide (p=<0.001). Just under half (48%) of the suicide-bereaved group described bereavement by the suicide of a relative, ranked in order of frequency as follows: parent, second-degree relative, sibling, and third degree relative. These differences became non-significant when considering only a family history of suicide other than the index bereavement (p=0.071), which we termed a **family history of non-index suicide**. This variable was chosen for the final model, but to assess whether adjusting for this would over-adjust for genetic risk of suicide, I tested for an association between kinship to the deceased (related *versus* unrelated) and family history of non-index suicide, finding none (p=0.905). This was probably due to the significant association between bereavement by sudden natural causes and having been related to the deceased (p=<0.001).

In relation to pre-bereavement suicidality, there were no group differences in pre-bereavement suicidal thoughts (p=0.122) but a clear excess of past non-suicidal self-harm (p=0.029) and past suicide attempt (p=0.013) among those bereaved by suicide. As acts of suicidal and non-suicidal self-harm are regarded as a better predictor of future suicidal behaviour than suicidal thoughts (304), past non-suicidal self-harm and past suicide attempt were aggregated to create a variable used in the final model: pre-loss (suicidal and non-suicidal) self-harm. A slight excess in the group bereaved by suicide was of only borderline significance (p=0.050). This was likely to be due to the high degree of overlap between a history of pre-loss suicidal and non-suicidal self-harm in the group bereaved by sudden natural causes (73%) and by suicide (82%), but not in the group bereaved by sudden unnatural causes (54%).

Table 4-3: Table showing sample clinical characteristics

Participants bereaved by: **(* = p<0.05)**	**SND** (n=2106)	**SUD** (n=712)	**suicide** (n=614)	**Total** (n=3432)	**p-value**
Family Hx of psychiatric problems					
Yes	1,243	434	412	2,089	
%	59.0	61.0	67.1	60.9	
No	710	237	163	1,110	
%	33.7	33.3	26.6	32.3	
missing	153	41	39	233	
%	7.3	5.8	6.4	6.8	**0.005***
Family Hx of non-index suicide †					
Yes	123	41	53	217	
%	5.8	5.8	8.6	6.3	
No	1,825	628	521	2,974	
%	86.7	88.2	84.9	86.7	
missing	158	43	40	241	
%	7.5	6.0	6.5	7.0	0.071
Pre-loss suicidal thoughts (ST)					
Yes	584	178	185	947	
%	27.7	25.0	30.1	27.6	
No	1,374	495	389	2,258	
%	65.2	69.5	63.4	65.8	
missing	148	39	40	227	
%	7.0	5.5	6.5	7.0	0.122
Pre-loss non-suicidal SH					
Yes	400	121	141	662	
%	19.0	17.0	23.0	19.3	
No	1,552	551	433	2,536	
%	73.7	77.4	10.5	73.9	
missing	154	40	40	234	
%	7.3	5.6	6.5	6.8	**0.029***
Pre-loss suicide attempt (SA)					
Yes	125	28	49	202	
%	5.9	3.9	8.0	5.9	
No	1,827	644	525	2,996	
%	86.8	90.5	85.5	87.3	
missing	154	40	40	234	
%	7.3	5.6	6.5	6.8	**0.013***
Pre-loss non-suicidal SH & SA †					
Yes	434	134	150	718	
%	21.0	18.8	24.4	21.0	
No	1,515	537	423	2,475	
%	71.9	75.4	68.9	72.1	
missing	157	41	41	239	
%	7.5	5.8	6.7	7.0	.050
Pre-loss depression †					
Yes	370	129	143	642	
%	17.6	18.1	23.3	18.7	
No	1,651	562	447	2,660	
%	78.4	78.9	72.8	77.5	
missing	85	21	24	130	
%	4.0	3.0	3.9	3.8	**0.015***

Participants bereaved by: (* = p<0.05)	SND (n=2106)	SUD (n=712)	suicide (n=614)	Total (n=3432)	p-value
Personality disorder screen positive					
Yes	743	227	225	1,195	
%	35.3	31.9	36.6	34.8	
No	1,232	454	356	2,042	
%	58.5	63.8	58.0	59.5	
missing	131	31	33	195	
%	6.0	4.4	5.4	6.0	0.071
Current psychological distress					
Yes	1,145	380	361	1,886	
%	54.4	53.4	59.0	55.0	
No	850	308	226	1,384	
%	40.4	43.3	37.0	40.3	
missing	111	24	27	162	
%	5.3	3.4	4.4	5.0	**0.045***
Grief screen					
Yes	277	87	100	464	
%	13.2	12.2	16.3	14.0	
No	1,699	594	481	2,774	
%	80.7	83.4	78.3	80.8	
missing	130	31	33	194	
%	6.2	4.4	5.4	5.7	0.065

(**Key**: SND = sudden natural death; SUD = sudden unnatural death; SH = self-harm; † = variable used in the final model)

Pre-loss depression, as defined using the CIDI lifetime depression screen, was significantly more prevalent among those bereaved by suicide (p=0.015). There were no significant group differences in history of past treatment for psychological problems, including psychiatric admission (p=0.063).

In relation to current psychosocial functioning, there were no significant differences between groups in relation to a screen for possible personality disorder (p=0.071). Screening for current mental health symptoms showed that a significantly greater proportion of respondents bereaved by suicide (59%; p=0.045) scored positive on the K10 for current psychological distress than the groups bereaved by sudden natural death (54%) and sudden unnatural death (53%). There were no group differences on the 1 item taken from the PG-13 Inventory of Complicated Grief screen (p=0.065).

Regarding help-seeking, there were no group differences among those who had self-harmed since the bereavement (both suicidal and non-suicidal self-harm) in relation to whether they had sought help from anyone (p=0.167), with an overall minority of 33% of this group having sought help following the episode of self-harm.

4.2.7.3 Characteristics of the bereavement

Group differences in relation to the circumstances of the bereavement are tabulated below (see Table 4-4: Table showing sample bereavement characteristics).

The mean length of time since bereavement was 4.9 years (SD=5.3), ranging from 1 day to 30 years, with no significant differences between group means. When dichotomised at the 2 year mark, those bereaved by sudden natural causes were significantly more likely than the other two groups to report a bereavement that had happened in the last 2 years (p=<0.001). They were also significantly more likely than the other two groups to describe themselves as very close to the deceased (p=<0.001); to have been in contact with the deceased at least weekly (p=<0.001); to report the deceased as aged 18 or above (p=<0.001); and to have been a blood relative of the deceased (p=<0.001).

There were significant group differences in the reported relationship to the deceased (p<0.001). The most common loss reported in the groups bereaved by sudden unnatural causes and suicide was that of a friend: 38% and 41% respectively, *versus* 10% in the group bereaved by sudden natural causes. The most common loss reported in the group bereaved by sudden natural causes was that of a grandparent: 31% compared with 4% for the group bereaved by sudden unnatural causes and 2% for the group bereaved by suicide. Together parental deaths accounted for 39% of losses in the group bereaved by sudden natural causes, compared with less than 20% in each of the other two groups. The age at death of deceased grandparents ranged from 45 to 98 (mean=76.0; SD=8.4), and was significantly younger for those bereaved by suicide (mean=67.0; SD=7.6) than for those bereaved by sudden natural deaths (mean=76.0; SD=8.3) or sudden unnatural deaths (mean=76.0; SD=7.8).

Overall the mean age of the deceased was significantly younger in those bereaved by sudden unnatural causes (mean=31.0; SD=17.4) and suicide (mean=31.9; SD=15.2) compared with those bereaved by sudden natural causes (mean=55.0; SD=21.5; p=<0.001), largely due to the kinship patterns described above. The mean age of respondents at the time of the death was significantly younger in those bereaved by sudden unnatural death (mean=20.0; SD=5.8) compared with suicide (mean=20.1;

SD=5.8) or sudden natural death (mean=20.1; SD=6.2; p=0.02) but clinically this difference was regarded as minimal.

Those bereaved by suicide appeared to report themselves as least close to the deceased, with 59% of that sample rating their closeness as 'very close' (as opposed to 'quite close') in comparison with 79% for those bereaved by natural causes, and 72% for those bereaved by sudden unnatural causes (p=<0.001).

To determine whether respondents who were non-relatives rated themselves as closer to the deceased than did non-relatives, as per the tendency of young adults to identify more with their peer group than with family, I tested for an association between kinship and closeness. This showed that there was a significant association, but in the opposite direction: those who were related to the deceased were significantly more likely to report themselves as closer to the deceased (79% *versus* 64%; p=<0.001) than non-relatives.

Regarding receipt of bereavement support, there were no group differences in whether respondents had received help or not after the bereavement (p=0.171), with an overall majority of 76% having received help. Among those who did report receiving help, those who had been bereaved by unnatural causes used a mean of 1.85 sources of help, as did those bereaved by suicide, compared with a mean of 1.77 for those bereaved by natural causes (p=0.005). In the overall sample, those reporting high levels of perceived stigma in relation to the death (using stigma dichotomised at the median) were significantly less likely than those reporting low levels of perceived stigma to have received help (76% *versus* 83%; p=<0.001).

Table 4-4: Table showing sample bereavement characteristics

Participants bereaved by: (* = p<0.05)	**SND** (n=2106)	**SUD** (n=712)	**suicide** (n=614)	**Total** (n=3432)	**p-value**
Any help received after death					
Yes	430	130	142	702	
%	20.4	18.3	23.1	20.5	
No	1,589	559	447	2,595	
%	75.5	78.5	72.8	75.6	
missing	87	23	25	135	
%	4.1	3.2	4.1	3.9	0.171
Time since bereavement (years) †					
mean	4.8	5.3	5.1	5.0	
SD	5.3	5.4	5.0	5.3	0.140
less than 2 years	706	184	168	1,058	
%	33.5	25.8	27.4	30.8	
more than 2 years	1,400	528	445	2,373	
%	66.5	74.2	72.5	69.1	
missing	0	0	1	1	
%	0.0	0.0	0.2	0.0	**<0.001***
Closeness to the deceased					
very close	1,666	512	359	2,537	
%	79.0	71.9	58.5	74.0	
quite close	423	198	254	875	
%	20.0	27.8	41.4	26.0	
missing	17	2	1	20	
%	1.0	0.3	0.3	1.0	**<0.001***
Kinship to the deceased †					
blood relative	1,786	351	296	2,433	
%	84.8	49.3	48.2	70.9	
un-related	313	356	317	980	
%	15.0	50.0	51.6	29.0	
missing	7	5	1	13	
%	0.0	0.7	0.3	0.0	**<0.001***
Frequency of contact with deceased					
contact weekly or more	1,567	491	412	2,470	
%	74.4	69.0	67.1	71.9	
contact less than weekly	518	219	202	939	
%	24.6	30.8	32.9	27.4	
missing	21	2	0	23	
%	1.0	0.3	0.0	0.7	**<0.001***
Age of deceased					
under 18	141	117	84	342	
%	6.7	16.4	13.7	10.0	
18 and over	1,963	593	530	3,086	
%	93.2	83.3	86.3	89.9	
missing	2	2	0	4	
%	0.1	0.3	0.0	0.1	**<0.001***

(Key: SND = sudden natural death; SUD = sudden unnatural death; † = variable used in the final model)

4.2.8 Collinearity of key clinical variables

The results of tests for collinearity were briefly described in the Method in relation to choice of covariates for the final model (see 3.18.4). These tests, with a threshold for significance set at the 5% level and values of 0.3-0.7 defining moderate correlation, showed that most of the main socio-demographic and clinical variables were weakly positively correlated (e.g. r=0.15 for personality disorder and previous suicidal and non-suicidal self-harm). The main bereavement-related covariates (kinship to the deceased, closeness to the deceased, and time since bereavement) were also weakly positively correlated (e.g. r=0.15 for closeness to the deceased and kinship to the deceased). Other specific findings were that:

- all variables relating to past psychological problems (previous depression, previous non-suicidal self-injury, previous suicidal thoughts, previous suicide attempts) were weakly or moderately correlated
- a family history of suicide was weakly correlated with a family psychiatric history
- measures of current distress (complicated grief screen, PD screen, K10 distress) were weakly collinear with each other and with past psychological problems, pre-loss depression, and also with pre-loss self-harm (both suicidal and non-suicidal)
- there was a very weak correlation between kinship to the deceased and a family history of psychological problems, suggesting a need to control for the higher levels of family psychopathology in those related to the deceased
- a variable aggregating pre-loss psychological problems (depression and/or suicidal and non-suicidal self-harm) was weakly correlated with all outcome measures apart from post-bereavement drop-out from work or education, with which there was no correlation. Pre-loss psychological problems were also weakly correlated with the outcome incident depression. This suggested a need to adjust for pre-loss psychological problems to account for differences in the proportions of those who were chronically depressed or suicidal. Any excess risk of adverse suicide-related outcomes could then be understood as due to the effect of suicide bereavement in addition to any chronic suicidality.

4.2.9 Clustering within HEIs

A cluster variable was assigned according to HEI (n=37). In the final sample the numbers of participants from each HEI ranged from n=3 (Cardiff Metropolitan University) to n=364 (University of Leeds). The mean number of participants from each HEI was 20.4 (SD=10.3), and the median was 21. This skewed distribution in cluster size was taken into account in the sensitivity analysis by dropping those HEIs with less than this median number of respondents.

There were significant differences between HEIs in relation to the event rates for suicide attempts (p=<0.001), such that the prevalence of post-bereavement suicide attempt varied from 0% in 4 HEIs to 23% in one HEI (mean prevalence 6.6%), but no differences in relation to suicidal thoughts (p=0.298).

The effect of clustering at the HEI level was investigated using a random effects model. This showed that clustering of respondents within HEIs was minimal for the main outcomes of interest, accounting for only 0.8% of the total variance for suicidal thoughts (rho=0.008), and 4.7% of the total variance for suicide attempts (rho=0.047). This indicated that use of the cluster variable had very little impact on suicidal ideation but some impact on suicide attempt; justifying its inclusion in the model.

4.2.10 Relationship between mode of bereavement and main outcomes

The table that follows (see Table 4-5: Comparison of main outcomes by bereavement exposure) outlines the prevalence of each binary and tertile outcome, and mean values for each continuous outcome, by bereavement exposure. This table also includes covariates related to my primary outcomes: lifetime prevalence of suicidal ideation and suicide attempt. This is to allow indirect comparison of my primary outcomes to population norms, as my sampling strategy did not involve a non-bereaved control group. These norms are derived from the Adult Psychiatric Morbidity Survey (APMS) dataset for 2007 (275), providing estimates of the population prevalence of self-reported lifetime suicidality in people aged above 16 in England. The figures corresponding to the sample age-range of 18-40 were as follows:

- estimates of the lifetime prevalence of suicidal ideation were: 20.6% in those aged 16-24; 18.8% in those age 25-34, and 19.9% in those aged 35-44.
- estimates of the lifetime prevalence of suicide attempts were: 7.3% in those aged 16-24; 6.6% in those age 25-34, and 6.3% in those aged 35-44.
- estimates of the lifetime prevalence of non-suicidal self-harm were: 12.4% in those aged 16-24; 6.6% in those age 25-34, and 5.8% in those aged 35-44.

The highest APMS lifetime prevalence of **suicidal ideation** in any age group was 20.6%, which is much lower than the lifetime prevalence of suicidal ideation in my sample of people bereaved by sudden natural deaths (53%), sudden unnatural deaths (54%), and suicide (60%). The highest APMS lifetime prevalence of **suicide attempts** in any age group was 7.3%, which is slightly lower than that in my sample of people bereaved by sudden natural deaths (10%), sudden unnatural deaths (9%), and suicide (15%). The highest APMS lifetime prevalence of **non-suicidal self-harm** in any age group was 12.4%, which was much lower than the lifetime prevalence of non-suicidal self-harm in my sample of people bereaved by sudden natural deaths (30%), sudden unnatural deaths (30%), and suicide (35%).

Formal statistical comparison of these groups to the APMS baseline would only be possible with access to the full APMS dataset. However this dataset does not include a measure of exposure to sudden bereavement, so it would not strictly constitute a non-bereaved control sample.

From the table (see Table 4-5: Comparison of main outcomes by bereavement exposure) it can be seen that 9% of those bereaved by suicide reported post-bereavement suicide attempts, compared with 5% for those bereaved by sudden natural causes. When considering lifetime suicide attempts, the prevalence among those bereaved by suicide was 15%, compared with 10% for those bereaved by sudden natural causes and 6.5% for the APMS sample of a similar age. In crude terms this represents an excess of 25 people bereaved by suicide reporting suicide attempt after bereavement compared with those bereaved by sudden natural causes. It also represents an excess of 53 people bereaved by suicide reporting lifetime suicide attempt compared with the APMS baseline.

Table 4-5: Comparison of main outcomes by bereavement exposure

Exposure Outcome	SND (n = 2,106)	SUD (n = 712)	Suicide (n = 614)	Total (n=3,432)	p-value (*p=<0.05)
Primary outcomes					
prevalence of post-bereavement suicidal ideation	911 (43%)	322 (45%)	299 (49%)	1,532 (45%)	0.108
prevalence of post-bereavement suicide attempts	112 (5%)	42 (6%)	56 (9%)	210 (6%)	**0.006***
Suicide-related variables for comparison with population norms					
lifetime prevalence of suicidal ideation	1,115 (53%)	383 (54%)	367 (60%)	1,865 (54%)	**0.015***
APMS lifetime prevalence of suicidal ideation (maximum in any corresponding age group)				20.6%	
lifetime prevalence of suicide attempts	210 (10%)	62 (9%)	93 (15%)	365 (11%)	**0.001***
APMS lifetime prevalence of suicidal attempts (maximum in any corresponding age group)				7.3%	
lifetime prevalence of non-suicidal self-harm	634 (30%)	210 (30%)	214 (35%)	1,058 (31%)	0.081
APMS lifetime prevalence of non-suicidal self-harm (max in any corresponding age group)				12.4%	
Secondary binary outcomes					
prevalence of poor current social functioning	557 (27%)	178 (25%)	200 (33%)	935 (27%)	**0.005***
prevalence of post-bereavement non-suicidal self-harm	438 (20%)	149 (21.0%)	151 (24.6%)	738 (21.5%)	0.155

Exposure Outcome	SND (n = 2,106)	SUD (n = 712)	Suicide (n = 614)	Total (n=3,432)	p-value (* p=<0.05)
Secondary binary outcomes					
prevalence of post-bereavement drop-out from work or education	96 (5%)	44 (6%)	48 (8%)	199 (6%)	**0.012***
prevalence of post-bereavement depression	647 (31%)	249 (35%)	180 (29%)	1076 (31%)	0.137
Secondary continuous outcomes					
mean stigma score (SD)	11.9 (3.8)	12.3 (4.0)	14.0 (4.3)	12.3 (4.0)	**<0.001***
mean shame score (SD)	12.3 (3.5)	13.25 (3.6)	14.8 (4.0)	12.9 (3.8)	**<0.001***
Secondary continuous outcomes expressed as tertiles					
proportion of those in highest tertile for responsibility score	542 (26%)	200 (28%)	292 (48%)	1,034 (30%)	**<0.001***
proportion of those in highest tertile for guilt score	607 (29%)	206 (29%)	261 (43%)	1,074 (31%)	**<0.001***

(Key: SND = sudden natural death; SUD = sudden unnatural death)

Using the approach of listwise deletion, respondents were included in the analysis of each outcome if they had complete data for all 8 covariates used in the final model. This initially reduced the group sizes to n=1,884 bereaved by sudden natural deaths, n=633 bereaved by sudden unnatural deaths, and n= 553 bereaved by suicide. Group sizes were reduced further for the analysis of each outcome (see Table 4-1: Extent of missing data on key variables by exposure group), but for any given analysis never fell below n=520 (and thus not below the n=466 required for adequate power).

Using listwise deletion meant that slightly differing sub-samples were used in the analysis of each outcome. For example n=3,068 were included in the analysis of group differences on suicidal ideation, n=3,069 for suicide attempt, and n=3,070 for depression. However the overlap between these sub-samples was 99.9%, such that groups differed in relation to the same 1 or 2 individuals, and risk estimates were therefore highly comparable.

4.2.10.1 Unadjusted analysis of associations between bereavement exposure and outcomes

Odds ratios (OR) and correlation coefficients for the unadjusted analyses of primary and secondary outcomes are presented below, using logistic and linear regression. These are firstly presented in relation to those bereaved by sudden natural death as the reference category and secondly using those bereaved by unnatural causes.

4.2.10.1.1 Comparisons with sudden natural bereavement as the reference category:

Using those bereaved by sudden natural causes as the reference category, the table below shows the results of the unadjusted analysis for all outcomes (see Table 4-6: Table showing results of unadjusted analysis of all outcomes (sudden natural deaths as reference category)).

4.2.10.1.1.1 Primary outcomes: unadjusted analysis

In comparison with sudden natural bereavement, exposure to suicide bereavement was associated with:

- significantly ↑ risk post-bereavement suicidal ideation (OR=1.25; 95% CI=1.037-1.505; p=0.019)
- significantly ↑ risk post-bereavement suicide attempt (OR=1.77; 95% CI=1.26-2.49; p=0.001)

4.2.10.1.1.2 Secondary outcomes: unadjusted analysis

Exposure to suicide bereavement was associated with:

- significantly ↑ risk poor current social functioning (OR=1.38; 95% CI=1.13-1.69; p=0.001)
- significantly ↑ risk post-bereavement drop out from work or education (OR=1.80; 95% CI=1.25-2.58; p=0.002)
- significantly higher stigma scores (coefficient=2.17; 95% CI=1.82-2.53; p=<0.001)
- significantly higher shame scores (coefficient=2.57; 95% CI=2.23-2.90; p=<0.001)
- significantly ↑ risk of reporting high responsibility scores (OR=2.46; 95% CI=2.04-2.97; p=<0.001)
- significantly ↑ risk of reporting high guilt scores (OR=1.81; 95% CI=1.53-2.15; p=<0.001)

There were no differences between the two groups in relation to unadjusted risk of post-bereavement incident depression or of post-bereavement non-suicidal self-harm.

A secondary hypothesis, that outcomes for the group bereaved by accidental death would be intermediate to the other two groups, was supported only in relation to GEQ subscales for stigma and shame. When compared with those bereaved by sudden natural causes, exposure to bereavement by sudden unnatural causes was associated with:

- significantly higher stigma scores (coefficient=0.52; 95% CI=0.18-0.85; p=0.002)
- significantly higher shame scores (coefficient=0.97; 95% CI=0.66-1.29); p=<0.001)

These coefficients were lower in magnitude than those for the group bereaved by suicide, which were also significantly greater than those of the baseline group.

No significant differences were detected between people bereaved by sudden unnatural causes compared with the baseline group of those bereaved by sudden natural causes in relation to unadjusted risk of any other secondary outcomes, or of either primary outcome.

Table 4-6: Table showing results of unadjusted analysis of all outcomes (sudden natural deaths as reference category)

Participants bereaved by:	**SND**	**SUD**				**Suicide**			
compared with SND	(n=2106)	(n=712)				(n=614)			
	reference	OR	p-value	CI lower	CI upper	OR	p-value	CI lower	CI upper
Primary outcomes (*p=<0.05)									
suicidal thoughts post-loss	1.00	1.05	0.554	0.88	1.26	**1.25***	**0.019**	1.04	1.51
suicide attempts post-loss	1.00	1.14	0.479	0.79	1.66	**1.77***	**0.001**	1.26	2.49
Secondary outcomes (*p=<0.01)									
poor current social functioning	1.00	0.91	0.358	0.75	1.11	**1.38***	**0.001**	1.13	1.69
post-loss non-suicidal SH	1.00	0.99	0.916	0.80	1.22	1.24	0.049	1.00	1.54
drop-out from work/education	1.00	1.42	0.063	0.98	2.07	**1.79***	**0.002**	1.25	2.58
post-loss depression	1.00	1.20	0.049	1.00	1.44	0.93	0.503	0.77	1.14
		coefficient				coefficient			
stigma	0.00	**0.52***	**0.002**	0.18	0.85	**2.17***	**<0.001**	1.82	2.53
shame	0.00	**0.97***	**<0.001**	0.66	1.29	**2.57***	**<0.001**	2.23	2.90
		OR				OR			
responsibility (highest tertile)	1.00	1.00	0.986	0.87	1.15	**2.46***	**<0.001**	2.04	2.97
guilt (highest tertile)	1.00	0.91	0.204	0.79	1.05	**1.81***	**<0.001**	1.52	2.15

(**Key**: SND = sudden natural death; SUD = sudden unnatural death; SH = self-harm)

4.2.10.1.2 Comparisons with sudden unnatural bereavement as the reference category:

Next, those bereaved by sudden unnatural causes were used as the reference category. The table below shows the results of the unadjusted analysis for all outcomes (see Table 4-7: Table showing results of unadjusted analysis of all outcomes (sudden unnatural deaths as reference category)).

4.2.10.1.2.1 Primary outcomes: unadjusted analysis

Exposure to suicide bereavement was associated with an increased risk of post-bereavement suicide attempts (OR=1.55; 95% CI=1.11- 2.36; p=0.042) compared with those bereaved by sudden unnatural causes, but no increased risk of suicidal ideation (p=0.135).

4.2.10.1.2.2 Secondary outcomes: unadjusted analysis

Exposure to suicide bereavement was associated with:

- significantly ↑ risk of poor social functioning (OR=1.52; 95% CI=1.19-1.94; p=0.001)
- significantly higher stigma scores (coefficient=1.65; 95% CI=1.23-2.08; p=<0.001)
- significantly higher shame scores (coefficient=1.59; 95% CI=1.20-1.99; p=<0.001)
- significantly ↑ risk of reporting high responsibility scores (OR=2.46; 95% CI=1.89-3.20; p=<0.001)
- significantly ↑ risk of reporting high guilt scores (OR=1.98; 95% CI=1.55-2.54; p=<0.001)

There were no significant differences between the two groups in relation to post-bereavement drop-out from work or education, post-bereavement incident depression, or post-bereavement non-suicidal self-harm.

Table 4-7: Table showing results of unadjusted analysis of all outcomes (sudden unnatural deaths as reference category)

Participants bereaved by:	**SUD**	**SND**				**Suicide**			
compared with SUD	(n=712)	(n=2106)				(n=614)			
Primary outcomes (*p=<0.05)	reference	OR	p-value	CI lower	CI upper	OR	p-value	CI lower	CI upper
suicidal thoughts post-loss	1.00	0.95	0.554	0.80	1.13	1.19	0.135	0.95	1.48
suicide attempts post-loss	1.00	0.87	0.479	0.60	1.27	**1.55***	**0.042**	1.02	2.36
Secondary outcomes (*p=<0.01)									
poor current social functioning	1.00	1.10	0.358	0.90	1.34	**1.52***	**0.001**	1.19	1.94
post-loss non-suicidal SH	1.00	1.01	0.916	0.82	1.25	1.26	0.088	0.97	1.63
drop-out from work/education	1.00	0.70	0.063	0.48	1.02	1.26	0.289	0.82	1.94
post-loss depression	1.00	0.83	0.049	0.69	1.00	0.78	0.036	0.61	0.98
		coefficient				coefficient			
stigma	0.00	**-0.52***	**0.002**	-0.85	-0.18	**1.65***	**<0.001**	1.23	2.08
shame	0.00	**-0.97***	**<0.001**	-1.29	-0.66	**1.59***	**<0.001**	1.20	1.99
		OR				OR			
responsibility (highest tertile)	1.00	1.00	0.986	0.87	1.15	**2.46***	**<0.001**	1.89	3.20
guilt (highest tertile)	1.00	1.10	0.204	0.95	1.26	**1.98***	**<0.001**	1.55	2.54

(**Key**: SND = sudden natural death; SUD = sudden unnatural death; SH = self-harm)

4.2.10.2 Multivariable analysis

The results of the adjusted analysis of primary outcomes using logistic and linear regression and block adjustment for 8 covariates are shown below. Firstly comparisons are made using those bereaved by sudden natural causes as the reference category, and secondly using those bereaved by sudden natural causes as the reference category.

The tables also include the results of testing two secondary hypotheses: firstly that stigma might explain any excess risk of adverse outcomes in those bereaved by suicide, and secondly that there was no interaction with kinship. Consequently the tables show the effect of adding stigma to the final model for each outcome, and p-values for tests for interaction with kinship. The results of testing these hypotheses are discussed in more detail in the following section (see 4.2.11).

4.2.10.2.1 Adjusted comparisons with sudden natural bereavement as the reference category:

The results described in this section are illustrated by tables showing all stages of the block adjustment for analysis of primary and secondary outcomes with reference to those bereaved by sudden natural causes.. Summary tables are presented at the end of this section.

4.2.10.2.1.1 Primary outcomes: adjusted analysis

4.2.10.2.1.1.1 Suicidal thoughts:

The significant excess risk of post-bereavement suicidal thoughts in people bereaved by suicide in the unadjusted model was attenuated and became non-significant in the final adjusted model (see Table 4-8: Table showing results of adjusted analysis of primary outcomes (sudden natural deaths as reference category)). The block adjustment approach showed that socio-demographic factors behaved as negative confounders (such that the unadjusted model under-estimated the magnitude of the risk), while all other factors apart from time behaved as positive confounders (such that the unadjusted model over-estimated the magnitude of the risk). Time had no confounding effect.

4.2.10.2.1.1.2 Suicide attempt:

The significant excess risk of post-bereavement suicide attempts in people bereaved by suicide in the unadjusted model remained significant in the final model (AOR= 1.65; 95% CI=1.12-2.42; p=0.012). Block adjustment showed that kinship and time behaved as negative confounders, while pre-loss depression, self-harm and family history attenuated the unadjusted risk. Adding stigma to this final model, to test a secondary hypothesis that this might explain the excess risk of suicide attempt, resulted in the risk being attenuated and becoming no longer significant. This suggested that the significantly higher levels of self-perceived stigma in those bereaved by suicide might explain the significant excess risk of suicide attempt.

4.2.10.2.1.2Secondary outcomes: adjusted analysis

4.2.10.2.1.2.1 Poor social functioning:

The significantly increased unadjusted risk of poor social functioning in people bereaved by suicide was no longer significant once adjusted for the 8 covariates (see Table 4-9: Table showing results of adjusted analysis of secondary binary outcomes (sudden natural deaths as reference category)). Socio-demographic factors and time since loss behaved as negative confounders, whilst kinship, pre-loss self-harm, and pre-loss depression contributed to attenuating the risk.

4.2.10.2.1.2.2 Post-bereavement non-suicidal self-harm

There were no differences in post-bereavement non-suicidal self-harm between groups in either an unadjusted or a fully-adjusted model, despite the apparent role of kinship, socio-demographic factors and time as negative confounders.

4.2.10.2.1.2.3 Post-bereavement drop-out from work or education:

The significantly increased unadjusted risk of post-bereavement drop-out from work or education in people bereaved by suicide remained significant in the final model (AOR=1.80; 95% CI=1.20-2.710; p=0.005). Pre-loss depression and self-harm behaved as negative confounders, while socio-demographic factors, kinship and time behaved as positive confounders. As it was possible that the excess risk of post-loss drop-out might be explained by pre-loss drop-out from work or education, a variable not included in the final model, I performed an additional analysis in which pre-loss

drop-out was added to the final model. This attenuated the risk by 0.02 but remained significantly elevated (AOR= 1.78; 95% CI=1.18-2.68; p=0.006). However, when stigma was added to the final model instead, the elevated risk of drop-out was attenuated and became non-significant, suggesting that the significantly higher self-perceived stigma in those bereaved by suicide might account for this excess risk.

4.2.10.2.1.2.4 Post-bereavement incident depression:

As with the unadjusted findings, there were no differences between people bereaved by sudden natural causes and suicide in relation to new-onset depression in a fully-adjusted model, despite the roles of kinship, pre-loss depression, and pre-loss self-harm as negative confounders. Time attenuated the unadjusted risk by only 0.1.

4.2.10.2.1.2.5 Stigma:

Results of linear regression for the GEQ subscale stigma (see Table 4-10: Table showing results of analysis of secondary continuous outcomes (sudden natural deaths as reference category)) show that compared with people bereaved by sudden natural causes, those bereaved by suicide had significantly higher unadjusted and adjusted stigma scores (adjusted coefficient=2.52; 95% CI=2.13-2.90; p=<0.001). Time and pre-loss psychopathology behaved as positive confounders, while socio-demographic factors, kinship and time behaving as negative confounders.

4.2.10.2.1.2.6 Shame:

Compared with people bereaved by sudden natural causes, those bereaved by suicide had significantly higher unadjusted and adjusted shame scores (adjusted coefficient =2.91; 95% CI=2.56-3.27; p=<0.001), with socio-demographic factors, kinship and family history behaving as negative confounders. Time and pre-loss psychopathology had no confounding effect.

4.2.10.2.1.2.7 Responsibility:

Results of ordinal logistic regression for those secondary outcomes transformed into tertiles, the GEQ subscales responsibility and guilt, are shown in Table 4-11: Table showing results of analysis of secondary tertile outcomes (sudden natural deaths as reference category). These show that compared with people bereaved by sudden natural causes, those bereaved by suicide were significantly more likely to report

high scores on responsibility for the death, both in an unadjusted and adjusted model (AOR= 2.55; 95% CI=2.06-3.16; p=<0.001). Socio-demographic variables, kinship, and time served to negatively confound the unadjusted risk. Pre-loss psychopathology and family history attenuated the unadjusted risk.

4.2.10.2.1.2.8 Guilt:

Compared with people bereaved by sudden natural causes, those bereaved by suicide were significantly more likely to report high guilt scores relating to the death in an unadjusted and adjusted model (AOR=1.98; 95% CI=1.62-2.41; p=<0.001), with pre-loss psychopathology and family history attenuating the unadjusted risk, and kinship and socio-demographic factors negatively confounding the risk. Time had no confounding effect.

4.2.10.2.1.2.9 Risk in those bereaved by sudden unnatural causes:

There were no group differences between those bereaved by sudden unnatural causes and those bereaved by sudden natural causes with respect to any of the primary or secondary outcomes apart from stigma and shame. Young adults bereaved by sudden unnatural causes had significantly higher unadjusted and adjusted stigma scores (adjusted coefficient =0.83; 95% CI=0.47-1.19; p=<0.001) than those bereaved by sudden natural causes. All covariates behaved as negative confounders apart from time, which had no effect on unadjusted risk. Those bereaved by sudden unnatural causes also had significantly higher unadjusted and adjusted shame scores (adjusted coefficient =1.29; 95% CI=0.95-1.63; p=<0.001). Again, all covariates behaved as negative confounders apart from time, which had no effect on unadjusted risk.

Table 4-8: Table showing results of adjusted analysis of primary outcomes (sudden natural deaths as reference category)

Exposure	**SND**	**SUD**				**Suicide**				
Outcome (*p=<0.05)	reference	OR	individual p-value	CI lower	CI upper	OR	individual p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
suicidal thoughts post-loss										
unadjusted	1.00	1.04	0.670	0.87	1.25	**1.27***	**0.014**	1.05	1.54	0.451
socdem	1.00	1.05	0.575	0.88	1.26	**1.28***	**0.012**	1.06	1.55	
socdem & kinship	1.00	1.02	0.836	0.84	1.23	**1.24***	**0.038**	1.01	1.51	
socdem & FHxSuicide (non-index)	1.00	1.05	0.581	0.88	1.26	**1.27***	**0.016**	1.05	1.53	
socdem & pre-loss depression	1.00	1.05	0.583	0.88	1.26	**1.25***	**0.023**	1.03	1.51	
socdem & pre-loss SH	1.00	1.06	0.525	0.88	1.27	**1.26***	**0.020**	1.04	1.52	
socdem & time since loss	1.00	1.03	0.759	0.86	1.24	**1.28***	**0.014**	1.05	1.55	
final model	1.00	0.97	0.740	0.80	1.18	1.13	0.237	0.92	1.39	0.632
further adjusted for stigma										
final model + stigma	1.00	0.84	0.101	0.69	1.03	0.78	0.027	0.62	0.97	
suicide attempt post-loss										
unadjusted	1.00	1.09	0.656	0.74	1.61	**1.76***	**0.001**	1.25	2.49	
socdem	1.00	1.10	0.614	0.75	1.62	**1.76***	**0.001**	1.25	2.50	0.517
socdem & kinship	1.00	1.14	0.516	0.76	1.71	**1.83***	**0.001**	1.27	2.65	
socdem & FHxSuicide (non-index)	1.00	1.11	0.610	0.75	1.63	**1.73***	**0.002**	1.22	2.45	
socdem & pre-loss depression	1.00	1.11	0.601	0.75	1.63	**1.70***	**0.003**	1.20	2.41	
socdem & pre-loss SH	1.00	1.12	0.575	0.76	1.65	**1.72***	**0.002**	1.21	2.43	
socdem & time since loss	1.00	1.09	0.674	0.74	1.61	**1.79***	**0.001**	1.26	2.54	
final model	1.00	1.11	0.621	0.73	1.68	**1.65***	**0.012**	1.12	2.42	0.370
further adjusted for stigma										
final model + stigma	1.00	0.97	0.887	0.63	1.48	1.11	0.610	0.74	1.67	

(**Key**: SND = sudden natural death; SUD = sudden unnatural death; SH = self-harm)

Table 4-9: Table showing results of adjusted analysis of secondary binary outcomes (sudden natural deaths as reference category)

Exposure	**SND**	**SUD**				**Suicide**				
Outcome (*p=<0.01)	reference	OR	individual p-value	CI lower	CI upper	OR	individual p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
poor current social functioning										
unadjusted	1.00	0.91	0.354	0.74	1.11	**1.41***	**0.001**	1.15	1.73	0.105
socdem	1.00	0.93	0.465	0.75	1.14	**1.44***	**<0.001**	1.18	1.77	
socdem & kinship	1.00	0.88	0.261	0.71	1.10	**1.37***	**0.004**	1.11	1.71	
socdem & FHxSuicide (non-index)	1.00	0.93	0.464	0.75	1.14	**1.44***	**<0.001**	1.17	1.77	
socdem & pre-loss depression	1.00	0.92	0.458	0.75	1.14	**1.37***	**0.003**	1.11	1.69	
socdem & pre-loss SH	1.00	0.94	0.540	0.76	1.16	**1.39***	**0.002**	1.13	1.72	
socdem & time since loss	1.00	0.93	0.479	0.75	1.41	**1.45***	**<0.001**	1.18	1.78	
final model	1.00	0.92	0.443	0.73	1.15	1.33	0.012	1.06	1.67	0.183
further adjusted for stigma										
final model + stigma	1.00	0.76	0.026	0.60	0.97	0.81	0.093	0.63	1.04	
post-bereavement non-suicidal SH										
unadjusted	1.00	1.00	0.980	0.81	1.25	1.29	0.021	1.04	1.61	0.713
socdem	1.00	1.02	0.839	0.82	1.27	1.32	0.013	1.06	1.65	
socdem & kinship	1.00	1.05	0.655	0.84	1.33	**1.37***	**0.009**	1.08	1.72	
socdem & FHxSuicide (non-index)	1.00	1.02	0.840	0.82	1.27	1.32	0.015	1.05	1.64	
socdem & pre-loss depression	1.00	1.02	0.834	0.82	1.28	1.29	0.026	1.03	1.61	
socdem & pre-loss SH	1.00	1.05	0.672	0.83	1.33	1.24	0.074	0.98	1.57	
socdem & time since loss	1.00	1.00	0.975	0.80	1.26	1.34	0.011	1.07	1.68	
final model	1.00	1.06	0.655	0.82	1.37	1.28	0.066	0.98	1.66	0.935
further adjusted for stigma										
final model + stigma	1.00	0.94	0.622	0.72	1.22	0.87	0.343	0.66	1.16	

Exposure	**SND**	**SUD**				**Suicide**				
Outcome (*p=<0.01)	reference	OR	individual p-value	CI lower	CI upper	OR	individual p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
drop-out from work/education										
unadjusted	1.00	1.41	0.079	0.96	2.07	**1.66***	**0.009**	1.14	2.43	0.593
socdem	1.00	1.44	0.062	0.98	2.12	**1.69***	**0.007**	1.16	2.47	
socdem & kinship	1.00	1.65	0.015	1.10	2.46	**1.95***	**0.001**	1.31	2.91	
socdem & FHxSuicide (non-index)	1.00	1.44	0.062	0.98	2.12	**1.69***	**0.007**	1.15	2.47	
socdem & pre-loss depression	1.00	1.45	0.061	0.98	2.13	**1.67***	**0.008**	1.14	2.45	
socdem & pre-loss SH	1.00	1.45	0.060	0.98	2.13	**1.68***	**0.008**	1.15	2.46	
socdem & time since loss	1.00	1.42	0.078	0.96	2.10	**1.70***	**0.007**	1.15	2.49	
final model	1.00	1.56	0.033	1.04	2.35	**1.80***	**0.005**	1.20	2.71	0.753
further adjusted for pre-loss dropout										
final model + pre-loss dropout	1.00	1.59	0.027	1.05	2.40	**1.78***	**0.006**	1.18	2.68	
further adjusted for stigma										
final model + stigma	1.00	1.44	0.084	0.95	2.18	1.36	0.156	0.89	2.09	
incident depression post-loss										
unadjusted	1.00	1.20	0.059	0.99	1.45	0.94	0.553	0.77	1.15	0.840
socdem	1.00	1.21	0.048	1.00	1.47	0.94	0.585	0.77	1.16	
socdem & kinship	1.00	**1.33***	**0.005**	1.09	1.63	1.04	0.706	0.84	1.30	
socdem & FHxSuicide (non-index)	1.00	1.21	0.048	1.00	1.47	0.94	0.569	0.77	1.16	
socdem & pre-loss depression	1.00	1.25	0.032	1.02	1.53	1.06	0.612	0.85	1.32	
socdem & pre-loss SH	1.00	1.20	0.057	0.99	1.46	0.97	0.774	0.79	1.19	
socdem & time since loss	1.00	1.19	0.089	0.98	1.44	0.93	0.518	0.75	1.15	
final model	1.00	1.22	0.071	0.98	1.53	1.03	0.840	0.81	1.30	0.894
further adjusted for stigma										
final model + stigma	1.00	1.06	0.632	0.84	1.34	**0.64***	**0.001**	0.49	0.82	

(**Key**: SND = sudden natural death; SUD = sudden unnatural death; SH = self-harm)

Table 4-10: Table showing results of analysis of secondary continuous outcomes (sudden natural deaths as reference category)

Exposure	SND	SUD				Suicide				
Outcome (*p=<0.01)	reference	coefficient	individual p-value	CI lower	CI upper	coefficient	individual p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
stigma (continuous variable)										
unadjusted	0.00	**0.53***	**0.003**	0.18	0.89	**2.26***	**<0.001**	1.89	2.64	0.537
socdem	0.00	**0.56***	**0.002**	0.20	0.91	**2.28***	**<0.001**	1.91	2.65	
socdem & kinship	0.00	**0.87***	**<0.001**	0.50	1.24	**2.61***	**<0.001**	2.23	3.00	
socdem & FHxSuicide (non-index)	0.00	**0.56***	**0.002**	0.21	0.91	**2.28***	**<0.001**	1.91	2.65	
socdem & pre-loss depression	0.00	**0.55***	**0.002**	0.20	0.90	**2.24***	**<0.001**	1.87	2.60	
socdem & pre-loss SH	0.00	**0.56***	**0.002**	0.21	0.91	**2.25***	**<0.001**	1.88	2.62	
socdem & time since loss	0.00	**0.53***	**0.003**	0.18	0.88	**2.27***	**<0.001**	1.90	2.64	
final model	0.00	**0.83***	**<0.001**	0.47	1.19	**2.52***	**<0.001**	2.13	2.90	0.264
shame (continuous variable)										
unadjusted	0.00	**1.03***	**<0.001**	0.71	1.36	**2.64***	**<0.001**	2.30	2.98	0.886
socdem	0.00	**1.05***	**<0.001**	0.73	1.38	**2.65***	**<0.001**	2.31	2.99	
socdem & kinship	0.00	**1.35***	**<0.001**	1.01	1.69	**2.97***	**<0.001**	2.61	3.32	
socdem & FHxSuicide (non-index)	0.00	**1.05***	**<0.001**	0.73	1.38	**2.66***	**<0.001**	2.32	3.00	
socdem & pre-loss depression	0.00	**1.05***	**<0.001**	0.73	1.38	**2.65***	**<0.001**	2.31	2.99	
socdem & pre-loss SH	0.00	**1.05***	**<0.001**	0.73	1.38	**2.65***	**<0.001**	2.31	2.99	
socdem & time since loss	0.00	**1.03***	**<0.001**	0.70	1.34	**2.65***	**<0.001**	2.31	2.98	
final model	0.00	**1.29***	**<0.001**	0.95	1.63	**2.91***	**<0.001**	2.56	3.27	0.590

(**Key**: SND = sudden natural death; SUD = sudden unnatural death; SH = self-harm)

Table 4-11: Table showing results of analysis of secondary tertile outcomes (sudden natural deaths as reference category)

Exposure	**SND**	**SUD**				**Suicide**				
Outcome (*p=<0.01)	reference	OR	individual p-value	CI lower	CI upper	OR	individual p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
responsibility (highest tertile)										
unadjusted	1.00	1.02	0.755	0.89	1.17	**2.50***	**<0.001**	2.08	3.01	0.794
socdem	1.00	1.03	0.663	0.90	1.19	**2.53***	**<0.001**	2.10	3.04	
socdem & kinship	1.00	1.04	0.650	0.89	1.21	**2.54***	**<0.001**	2.07	3.13	
socdem & FHxSuicide (non-index)	1.00	1.03	0.663	0.90	1.19	**2.52***	**<0.001**	2.10	3.03	
socdem & pre-loss depression	1.00	1.03	0.650	0.90	1.19	**2.49***	**<0.001**	2.06	3.01	
socdem & pre-loss SH	1.00	1.04	0.593	0.90	1.19	**2.50***	**<0.001**	2.07	3.03	
socdem & time since loss	1.00	1.04	0.617	0.90	1.20	**2.54***	**<0.001**	2.11	3.06	
final model	1.00	1.07	0.377	0.92	1.24	**2.55***	**<0.001**	2.06	3.16	0.690
guilt (highest tertile)										
unadjusted	1.00	0.92	0.214	0.80	1.05	**1.86***	**<0.001**	1.57	2.21	**0.002**
socdem	1.00	0.93	0.269	0.82	1.06	**1.88***	**<0.001**	1.57	2.25	
socdem & kinship	1.00	0.97	0.684	0.82	1.14	**1.95***	**<0.001**	1.62	2.36	
socdem & FHxSuicide (non-index)	1.00	0.93	0.266	0.82	1.06	**1.87***	**<0.001**	1.56	2.24	
socdem & pre-loss depression	1.00	0.93	0.252	0.82	1.05	**1.85***	**<0.001**	1.54	2.22	
socdem & pre-loss SH	1.00	0.94	0.304	0.83	1.06	**1.84***	**<0.001**	1.53	2.23	
socdem & time since loss	1.00	0.94	0.333	0.83	1.07	**1.88***	**<0.001**	1.57	2.26	
final model	1.00	1.01	0.906	0.87	1.18	**1.98***	**<0.001**	1.62	2.41	**0.002**

(**Key**: SND = sudden natural death; SUD = sudden unnatural death; SH = self-harm)

4.2.10.2.2 Summary tables for comparison with sudden natural bereavement:

Table 4-12: Summary table of adjusted analysis of primary outcomes (sudden natural deaths as reference category)

Exposure **Outcome** AOR: adjusted odds ratio (95% CI) ***p<= 0.05**	**Sudden natural deaths (n = 2,106)**	**Sudden unnatural deaths (n = 712)**	**Suicide (n = 614)**
AOR for suicidal ideation (post-bereavement)	1	0.97 (0.80-1.18) (p=0.740)	1.13 (0.92-1.39) (p=0.237)
AOR for suicide attempt (post-bereavement)	1	1.11 (0.73-1.68) (p=0.621)	**1.65* (1.12-2.42) (p=0.012)**
AOR for suicide attempt (post-bereavement) with stigma added to model	*1*	*0.97 (0.63-1.48) (p=0.887)*	*1.11 (0.74-1.67) (p=0.610)*

Table 4-13: Summary table of adjusted analysis of secondary outcomes (sudden natural deaths as reference category)

Exposure **Outcome** AOR: adjusted odds ratio (95% CI) ***p<= 0.01**	**Sudden natural deaths (n = 2,106)**	**Sudden unnatural deaths (n = 712)**	**Suicide (n = 614)**
AOR for poor social functioning (current)	1	0.92 (0.73-1.15) (p=0.443)	1.33 (1.06-1.67) (p=0.012)
AOR for post-bereavement non-suicidal self-harm	1	1.06 (0.82-1.37) (p=0.655)	1.28 (0.98-1.66) (p=0.066)
AOR for drop-out from work or education (post-bereavement)	1	1.56 (1.04-2.35) (p=0.033)	**1.80* (1.20-2.71) (p=0.005)**
AOR for drop-out from work or education (post-bereavement) with stigma added to model	*1*	*1.44 (0.95-2.18) (p=0.084)*	*1.36 (0.89-2.09) (p=0.156)*
AOR for post-bereavement depression	1	1.22 (0.98-1.53) (p=0.071)	1.03 (0.81-1.30) (p=0.840)
Adjusted coefficient for stigma score	0	**0.83* (0.47-1.19) (p=<0.001)**	**2.52* (2.13-2.90) (p=<0.001)**
Adjusted coefficient for shame score	0	**1.29* (0.95-1.63) (p=<0.001)**	**2.91* (2.56-3.27) (p=<0.001)**
AOR for highest responsibility tertile	1	1.07 (0.92-1.24) (p=0.377)	**2.55* (2.06-3.16) (p=<0.001)**
AOR for highest guilt tertile	1	1.01 (0.87-1.18) (p=0.906)	**1.98* (1.62-2.41) (p=<0.001)**

4.2.10.2.3 Adjusted comparisons with sudden unnatural bereavement as the reference category:

The tables that follow the text below show the results of all stages of the block adjustment for analysis of primary and secondary outcomes with reference to those bereaved by sudden unnatural causes. As before, summary tables are presented at the end of this section.

4.2.10.2.3.1 Primary outcomes: adjusted analysis

4.2.10.2.3.1.1 Suicidal ideation:

In both an unadjusted and adjusted model, people bereaved by suicide showed no excess risk of post-bereavement suicidal thoughts, despite the negative confounding effect of time.

4.2.10.2.3.1.2 Suicide attempt:

The significantly increased unadjusted risk of post-bereavement suicide attempt in people bereaved by suicide was attenuated and became of only borderline significance in the fully-adjusted model, despite the negative confounding effect of time.

4.2.10.2.3.2 Secondary outcomes: adjusted analysis

4.2.10.2.3.2.1 Poor social functioning:

People bereaved by suicide had a significantly increased risk of poor current social functioning in an unadjusted and adjusted model (AOR=1.46; 95% CI=1.12-1.89; p=0.005), with pre-loss psychopathology slightly attenuating the unadjusted risk, but other covariates having no confounding effect. When stigma was added to the final model this elevated risk was attenuated and became no longer significant, suggesting that the significantly higher levels of self-perceived stigma in those bereaved by suicide accounted for the excess risk of poor social functioning.

4.2.10.2.3.2.2 Post-bereavement non-suicidal self-harm

There were no differences in risk of post-bereavement non-suicidal self-harm between people bereaved by suicide and those bereaved by sudden unnatural causes in an unadjusted or adjusted model, despite the negative confounding effect of time.

4.2.10.2.3.2.3 Post-bereavement drop-out from work or education:

There were no differences in risk of drop-out from work or education between people bereaved by suicide and those bereaved by sudden unnatural causes in an unadjusted or adjusted model. Time and kinship behaved as negative confounders, whilst socio-demographic factors and pre-loss psychopathology behaved as positive confounders. The association remained non-significant when adding a measure of pre-loss drop-out, which controlled for pre-bereavement occupational dysfunction.

4.2.10.2.3.2.4 Post-bereavement incident depression:

There were no differences in risk of incident depression between people bereaved by suicide and those bereaved by sudden unnatural causes in an unadjusted and a fully-adjusted model.

4.2.10.2.3.2.5 Stigma:

People bereaved by suicide had significantly increased stigma scores in an unadjusted and a fully-adjusted model (coefficient=1.69; 95% CI=1.25-2.13; p=<0.001). Kinship, family history, and time behaved as negative confounders, with socio-demographic variables and pre-loss psychopathology attenuating the unadjusted risk slightly.

4.2.10.2.3.2.6 Shame:

People bereaved by suicide had significantly increased shame scores in an unadjusted and a fully-adjusted model (coefficient=1.62; 95% CI=1.22-2.03; p=<0.001). Again kinship, family history, and time behaved as negative confounders, with socio-demographic variables attenuating the unadjusted risk slightly.

4.2.10.2.3.2.7 Responsibility:

People bereaved by suicide were significantly more likely to report high scores on responsibility for the death in an unadjusted and a fully-adjusted model (AOR=2.39; 95% CI=1.83-3.12; p=<0.001). The covariates family history of non-index suicide, pre-loss depression and pre-loss self-harm attenuated the unadjusted risk very slightly, but all others had no effect.

4.2.10.2.3.2.8 Guilt:

People bereaved by suicide were significantly more likely to report high scores on guilt about the death in an unadjusted and a fully-adjusted model (AOR=1.96; 95% CI=1.52-2.52; p=<0.001). All covariates attenuated the unadjusted risk slightly, apart from kinship, which had no effect.

Table 4-14: Table showing results of analysis of primary outcomes (sudden unnatural deaths as reference category)

Exposure	**SUD**	**SND**				**suicide**				
Outcome (*p=<0.05)	reference	OR	p-value	CI lower	CI upper	OR	p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
suicidal thoughts post-loss										
unadjusted	1.00	0.96	0.670	0.80	1.15	1.22	0.087	0.97	1.53	0.451
socdem	1.00	0.95	0.575	0.79	1.14	1.21	0.097	0.97	1.53	
socdem & kinship	1.00	0.98	0.836	0.81	1.19	1.21	0.100	0.96	1.53	
socdem & FHxSuicide (non-index)	1.00	0.95	0.581	0.79	1.14	1.20	0.116	0.96	1.51	
socdem & pre-loss depression	1.00	0.95	0.583	0.79	1.14	1.19	0.144	0.94	1.50	
socdem & pre-loss SH	1.00	0.94	0.525	0.79	1.13	1.19	0.150	0.94	1.49	
socdem & time since loss	1.00	0.97	0.759	0.81	1.17	1.24	0.070	0.98	1.57	
final model	1.00	1.03	0.740	0.85	1.26	1.17	0.189	0.93	1.48	0.632
further adjusted for stigma										
final model + stigma	1.00	1.19	0.101	0.97	1.46	0.92	0.532	0.72	1.19	
suicide attempt post-loss										
unadjusted	1.00	0.92	0.656	0.62	1.35	**1.62***	**0.032**	1.04	2.50	0.517
socdem	1.00	0.91	0.614	0.62	1.33	**1.60***	**0.036**	1.03	2.48	
socdem & kinship	1.00	0.88	0.516	0.59	1.31	**1.60***	**0.035**	1.03	2.49	
socdem & FHxSuicide (non-index)	1.00	0.90	0.610	0.62	1.33	**1.56***	**0.046**	1.01	2.43	
socdem & pre-loss depression	1.00	0.90	0.601	0.61	1.33	1.54	0.056	0.99	2.38	
socdem & pre-loss SH	1.00	0.90	0.575	0.61	1.32	1.54	0.057	0.99	2.39	
socdem & time since loss	1.00	0.92	0.674	0.62	1.36	**1.64***	**0.029**	1.05	2.56	
final model	1.00	0.90	0.621	0.60	1.36	1.48	0.089	0.94	2.33	0.370
further adjusted for stigma										
final model + stigma	1.00	1.03	0.887	0.67	1.58	1.15	0.568	0.72	1.84	

(**Key**: SUD = sudden unnatural death; SND = sudden natural death; SH = self-harm)

Table 4-15: Table showing results of analysis of secondary binary outcomes (sudden unnatural deaths as reference category)

Exposure	**SUD**	**SND**				**Suicide**				
Outcome (*p=<0.01)	reference	OR	individual p-value	CI lower	CI upper	OR	individual p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
poor current social functioning										
unadjusted	1.00	1.10	0.354	0.90	1.35	**1.56***	**0.001**	1.21	2.00	0.105
socdem	1.00	1.08	0.465	0.88	1.33	**1.56***	**0.001**	1.21	2.01	
socdem & kinship	1.00	1.13	0.261	0.91	1.41	**1.56***	**0.001**	1.21	2.01	
socdem & FHxSuicide (non-index)	1.00	1.08	0.464	0.88	1.33	**1.56***	**0.001**	1.21	2.01	
socdem & pre-loss depression	1.00	1.08	0.458	0.88	1.34	**1.49***	**0.003**	1.15	1.93	
socdem & pre-loss SH	1.00	1.07	0.540	0.87	1.32	**1.49***	**0.003**	1.15	1.93	
socdem & time since loss	1.00	1.08	0.479	0.88	1.33	**1.56***	**0.001**	1.21	2.01	
final model	1.00	1.09	0.443	0.87	1.37	**1.46***	**0.005**	1.12	1.89	0.183
further adjusted for stigma										
final model + stigma	1.00	1.31	0.026	1.03	1.66	1.06	0.677	0.80	1.41	
post-bereavement non-suicidal SH										
unadjusted	1.00	1.00	0.980	0.80	1.24	1.29	0.061	0.99	1.68	0.713
socdem	1.00	0.98	0.839	0.79	1.22	1.29	0.061	0.99	1.69	
socdem & kinship	1.00	0.95	0.655	0.75	1.20	1.30	0.060	0.99	1.70	
socdem & FHxSuicide (non-index)	1.00	0.98	0.840	0.79	1.23	1.29	0.068	0.98	1.68	
socdem & pre-loss depression	1.00	0.98	0.834	0.78	1.22	1.26	0.098	0.96	1.65	
socdem & pre-loss SH	1.00	0.95	0.672	0.76	1.20	1.18	0.261	0.89	1.57	
socdem & time since loss	1.00	1.00	0.975	0.80	1.25	1.34	0.039	1.02	1.76	
final model	1.00	0.94	0.655	0.73	1.22	1.21	0.222	0.89	1.63	0.935
further adjusted for stigma										
final model + stigma	1.00	1.07	0.622	0.82	1.39	0.93	0.667	0.68	1.28	

Exposure	SUD	SND				Suicide				
Outcome (*p=<0.01)	reference	OR	p-value	CI lower	CI upper	OR	p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
drop-out from work/education										
unadjusted	1.00	0.71	0.079	0.48	1.04	1.18	0.473	0.75	1.84	0.593
socdem	1.00	0.69	0.062	0.47	1.02	1.17	0.490	0.75	1.84	
socdem & kinship	1.00	0.61	0.015	0.41	0.91	1.18	0.461	0.76	1.86	
socdem & FHxSuicide (non-index)	1.00	0.69	0.062	0.47	1.02	1.17	0.494	0.75	1.84	
socdem & pre-loss depression	1.00	0.69	0.061	0.47	1.02	1.16	0.530	0.74	1.81	
socdem & pre-loss SH	1.00	0.69	0.060	0.47	1.02	1.16	0.521	0.74	1.82	
socdem & time since loss	1.00	0.71	0.078	0.48	1.04	1.20	0.444	0.76	1.89	
final model	1.00	0.64	0.033	0.43	0.96	1.15	0.541	0.73	1.82	0.753
further adjusted for stigma										
final model + stigma	1.00	0.69	0.084	0.46	1.05	0.95	0.812	0.59	1.51	
further adjusted for pre-loss dropout										
final model + pre-loss dropout	1.00	0.63	0.027	0.42	0.95	1.12	0.635	0.71	1.78	
incident depression post-loss										
unadjusted	1.00	0.83	0.059	0.69	1.01	0.78	0.049	0.61	1.00	0.840
socdem	1.00	0.83	0.048	0.68	1.00	0.78	0.045	0.61	1.00	
socdem & kinship	1.00	**0.75***	**0.005**	0.62	0.92	0.78	0.050	0.61	1.00	
socdem & FHxSuicide (non-index)	1.00	0.83	0.048	0.68	1.00	0.78	0.043	0.61	0.99	
socdem & pre-loss depression	1.00	0.80	0.032	0.65	0.98	0.85	0.219	0.65	1.10	
socdem & pre-loss SH	1.00	0.83	0.057	0.69	1.01	0.81	0.085	0.63	1.03	
socdem & time since loss	1.00	0.84	0.089	0.69	1.03	0.79	0.061	0.61	1.01	
final model	1.00	0.82	0.071	0.66	1.02	0.84	0.197	0.64	1.10	0.894
further adjusted for stigma										
final model + stigma	1.00	0.95	0.632	0.75	1.19	**0.60***	**0.001**	0.45	0.80	

(**Key**: SUD = sudden unnatural death; SND = sudden natural death; SH = self-harm)

Table 4-16: Table showing results of analysis of secondary continuous outcomes (sudden unnatural deaths as reference category)

Exposure	**SUD**	**SND**				**suicide**				
Outcome (*p=<0.01)	reference	coefficient	individual p-value	CI lower	CI upper	coefficient	individual p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
stigma (continuous variable)										
unadjusted	0.00	**-0.53***	**0.003**	-0.89	-0.18	**1.73***	**<0.001**	1.28	2.18	0.537
socdem	0.00	**-0.56***	**0.002**	-0.91	-0.21	**1.72***	**<0.001**	1.28	2.17	
socdem & kinship	0.00	**-0.87***	**<0.001**	-1.24	-0.50	**1.74***	**<0.001**	1.30	2.18	
socdem & FHxSuicide (non-index)	0.00	**-0.56***	**0.002**	-0.91	-0.20	**1.73***	**<0.001**	1.28	2.17	
socdem & pre-loss depression	0.00	**-0.55***	**0.002**	-0.90	-0.20	**1.68***	**<0.001**	1.24	2.13	
socdem & pre-loss SH	0.00	**-0.56***	**0.002**	-0.91	-0.21	**1.69***	**<0.001**	1.25	2.13	
socdem & time since loss	0.00	**-0.53***	**0.003**	-0.88	-0.18	**1.74***	**<0.001**	1.30	2.18	
final model	0.00	**-0.83***	**<0.001**	-1.19	-0.47	**1.69***	**<0.001**	1.25	2.13	0.264
shame (continuous variable)										
unadjusted	0.00	**-1.03***	**<0.001**	-1.36	-0.71	**1.61***	**<0.001**	1.19	2.02	0.886
socdem	0.00	**-1.05***	**<0.001**	-1.38	-0.73	**1.60***	**<0.001**	1.19	2.01	
socdem & kinship	0.00	**-1.35***	**<0.001**	-1.69	-1.01	**1.62***	**<0.001**	1.21	2.03	
socdem & FHxSuicide (non-index)	0.00	**-1.05***	**<0.001**	-1.38	-0.73	**1.61***	**<0.001**	1.20	2.01	
socdem & pre-loss depression	0.00	**-1.05***	**<0.001**	-1.38	-0.73	**1.60***	**<0.001**	1.19	2.00	
socdem & pre-loss SH	0.00	**-1.05***	**<0.001**	-1.38	-0.73	**1.60***	**<0.001**	1.19	2.01	
socdem & time since loss	0.00	**-1.02***	**<0.001**	-1.34	-0.70	**1.62***	**<0.001**	1.22	2.03	
final model	0.00	**-1.29***	**<0.001**	-1.63	-0.95	**1.62***	**<0.001**	1.22	2.03	0.590

(**Key**: SUD = sudden unnatural death; SND = sudden natural death; SH = self-harm)

Table 4-17: Table showing results of analysis of secondary tertile outcomes (sudden unnatural deaths as reference category)

Exposure	**SUD**	**SND**				**suicide**				
Outcome (*p=<0.01)	reference	OR	individual p-value	CI lower	CI upper	OR	individual p-value	CI lower	CI upper	Interaction with kinship **(p<0.05)**
responsibility (highest tertile)										
unadjusted	1.00	0.98	0.755	0.86	1.12	**2.45***	**<0.001**	1.90	3.17	0.794
Socdem	1.00	0.97	0.663	0.84	1.12	**2.45***	**<0.001**	1.88	3.19	
socdem & kinship	1.00	0.97	0.650	0.83	1.13	**2.45***	**<0.001**	1.88	3.19	
socdem & FHxSuicide (non-index)	1.00	0.97	0.663	0.84	1.12	**2.44***	**<0.001**	1.88	3.18	
socdem & pre-loss depression	1.00	0.97	0.650	0.84	1.11	**2.41***	**<0.001**	1.85	3.14	
socdem & pre-loss SH	1.00	0.96	0.593	0.84	1.11	**2.41***	**<0.001**	1.85	3.15	
socdem & time since loss	1.00	0.96	0.617	0.84	1.11	**2.45***	**<0.001**	1.87	3.20	
final model	1.00	0.94	0.377	0.81	1.08	**2.39***	**<0.001**	1.83	3.12	0.691
guilt (highest tertile)										
unadjusted	1.00	1.09	0.214	0.95	1.25	**2.03***	**<0.001**	1.58	2.60	**0.002**
Socdem	1.00	1.08	0.269	0.95	1.22	**2.02***	**<0.001**	1.57	2.60	
socdem & kinship	1.00	1.04	0.684	0.88	1.22	**2.02***	**<0.001**	1.57	2.60	
socdem & FHxSuicide (non-index)	1.00	1.08	0.266	0.95	1.23	**2.01***	**<0.001**	1.56	2.60	
socdem & pre-loss depression	1.00	1.07	0.252	0.95	1.21	**1.98***	**<0.001**	1.54	2.55	
socdem & pre-loss SH	1.00	1.07	0.304	0.94	1.21	**1.97***	**<0.001**	1.53	2.54	
socdem & time since loss	1.00	1.07	0.333	0.94	1.22	**2.01***	**<0.001**	1.56	2.60	
final model	1.00	0.99	0.906	0.85	1.16	**1.96***	**<0.001**	1.52	2.52	**0.002**

(**Key**: SUD = sudden unnatural death; SND = sudden natural death; SH = self-harm)

4.2.10.2.4 Summary tables for comparison with sudden unnatural bereavement:

Table 4-18: Summary table of adjusted analysis of primary outcomes (sudden unnatural deaths as reference category)

Exposure **Outcome** AOR=adjusted odds ratio (95% CI) ***p<= 0.05**	**Sudden unnatural death (n = 712)**	**Sudden natural death (n = 2,106)**	**Suicide (n = 614)**
AOR for suicidal ideation (post-bereavement)	1	1.03 (0.85-1.26) (p=0.740)	1.17 (0.93-1.48) (p=0.189)
AOR for suicide attempt (post-bereavement)	1	0.90 (0.60-1.36) (p=0.621)	1.48 (0.94-2.33) (p=0.089)

Table 4-19: Summary table of adjusted analysis of secondary outcomes (sudden unnatural deaths as reference category)

Exposure **Outcome** AOR: adjusted odds ratio (95% CI) ***p<= 0.01**	**Sudden unnatural death (n = 712)**	**Sudden natural death (n = 2,106)**	**Suicide (n = 614)**
AOR for poor social functioning (current)	1	1.09 (0.87-1.37) (p=0.443)	**1.46* (1.12-1.89) (p=0.005)**
AOR for poor social functioning (current) with stigma added to model	*1*	*1.31 (1.03-1.66) (p=0.026)*	*1.06 (0.80-1.41) (p=0.667)*
AOR for post-bereavement non-suicidal self-harm	1	0.94 (0.73-1.22) (p=0.655)	1.21 (0.89-1.63) (p=0.222)
AOR for drop-out from work or education (post-bereavement)	1	0.64 (0.43-0.96) (p=0.033)	1.15 (0.73-1.82) (p=0.541)
AOR for post-bereavement depression	1	0.82 (0.66-1.02) (p=0.071)	0.84 (0.64-1.10) (p=0.197)
Adjusted coefficient for stigma score	0	**-0.83* (-1.19- -0.47) (p=<0.001)**	**1.69* (1.25 – 2.13) (p=<0.001)**
Adjusted coefficient for shame score	0	**-1.29* (-1.63 - -0.95) (p=<0.001)**	**1.62* (1.22-2.03) (p=<0.001)**
AOR for highest responsibility tertile	1	0.94 (0.81-1.08) (p=0.377)	**2.39* (1.83-3.12) (p=<0.001)**
AOR for highest guilt tertile	1	0.99 (0.85-1.16) (p=0.906)	**1.96* (1.52-2.52) (p=<0.001)**

4.2.11 Secondary hypotheses

4.2.11.1 Intermediate risks

A secondary hypothesis, that outcomes for the group bereaved by sudden unnatural causes would be intermediate to the other two groups, was supported only in relation to the outcomes stigma and shame (see Table 4-12: Summary table of adjusted analysis of primary outcomes (sudden natural deaths as reference category). That is to say, stigma and shame were the only outcomes for which there were significant group differences between all three groups, with the magnitude of the coefficients for both stigma and shame ranked in ascending order as follows: sudden natural deaths, sudden unnatural deaths, and suicide.

4.2.11.2 Stigma as an explanatory variable

A further secondary hypothesis, that any excess risk of adverse outcomes in the group bereaved by suicide would be explained by higher mean scores on self-perceived stigma, was supported. Firstly scores for self-perceived stigma were significantly higher in the group bereaved by suicide in relation to either reference category. In the overall sample stigma was weakly correlated with all other outcomes at the 5% level of significance except social functioning, with which it was moderately correlated. High stigma scores were also associated with post-bereavement suicidal ideation and attempts (both p=<0.001). These observations provided initial support for the possibility of stigma being an explanatory variable. The main tables show the results of adding the stigma variable to the final model for each of the three outcomes in which risks were significantly higher among those bereaved by suicide, which are summarised here.

In relation to the reference category of people bereaved by sudden natural causes, the effect of stigma was to:

- attenuate the significantly increased adjusted risk of suicide attempts in people bereaved by suicide, such that it was **no longer significant**
- attenuate the significantly increased adjusted risk of post-bereavement drop-out from work or education in people bereaved by suicide, such that it was **no longer significant.**

In relation to the reference category of people bereaved by sudden unnatural causes, the effect of stigma was to:

- attenuate the significantly increased adjusted risk of poor social functioning in those bereaved by suicide, such that it was **no longer significant.**

This suggests that high levels of self-perceived stigma among people bereaved by suicide may account for the specific differences in psychosocial functioning between this group and those bereaved by sudden natural causes (namely a significantly increased risk of suicide attempt and of post-bereavement drop-out from work or education) as well as those bereaved by sudden unnatural causes (namely poor social functioning). However the possibility of residual confounding remains (see 5.2.4.2).

4.2.11.3 Interaction with kinship

A final secondary hypothesis was that there would be no interaction between bereavement exposure and kinship to the deceased, such that any associations would be equally strong whether the bereaved were related or unrelated to the deceased. The results of significance tests of the interaction between kinship and exposure for each outcome are shown in the far right-hand column of the main results tables above. The hypothesis was proved in relation to all outcomes for which there was an association with exposure apart from **guilt** (p=0.002). Stratifying the sample by kinship for this outcome (see table below) showed that risks of reporting high levels of guilt were significantly elevated both in suicide-bereaved relatives and suicide-bereaved non-relatives, whichever reference category was used. It was also notable, even though the statistical test did not assess this specific difference, that the ranking for risk magnitude differed depending on the specific comparison group.

When compared with those bereaved by sudden natural causes (see Table 4-20: Table showing results of stratification on kinship for guilt (sudden natural deaths as reference category), the magnitude of the risk of high guilt scores in the suicide-bereaved was greater for non-relatives. When compared with those bereaved by sudden unnatural causes (see Table 4-21: Table showing results of stratification on kinship for guilt (sudden unnatural deaths as reference category) the magnitude of the risk of high guilt scores in the suicide-bereaved was greater for relatives.

Table 4-20: Table showing results of stratification on kinship for guilt (sudden natural deaths as reference category)

Exposure **Outcome** AOR=adjusted odds ratio (95% CI) ***p<= 0.01**	**Sudden natural death (n = 2,106)**	**Sudden unnatural death (n = 712)**	**Suicide (n = 614)**
AOR for highest guilt tertile (overall)	1	1.01 (0.87-1.18) (p=0.906)	**1.98* (1.62-2.41) (p=<0.001)**
Stratified by kinship			
AOR for highest guilt tertile in non-relatives	1	**1.50* (1.20-1.87) (p=<0.001)**	**2.76* (2.09-3.64) (p=<0.001)**
AOR for highest guilt tertile in relatives	1	0.84 (0.63-1.11) (p=0.222)	**1.74* (1.31-2.31) (p=<0.001)**

Table 4-21: Table showing results of stratification on kinship for guilt (sudden unnatural deaths as reference category)

Exposure **Outcome** AOR=adjusted odds ratio (95% CI) ***p<= 0.01**	**Sudden unnatural death (n = 712)**	**Sudden natural death (n = 2,106)**	**Suicide (n = 614)**
AOR for highest guilt tertile (overall)	1	0.99 (0.85-1.16) (p=0.906)	**1.96* (1.52-2.52) (p=<0.001)**
Stratified by kinship			
AOR for highest guilt tertile in non-relatives	1	**0.67* (0.54-0.83) (p=<0.001)**	**1.84* (1.40-2.43) (p=<0.001)**
AOR for highest guilt tertile in relatives	1	1.19 (0.90-1.59) (p=0.222)	**2.08* (1.32-3.28) (p=0.002)**

It was also notable, even though the hypothesis did not test this specifically, that among those bereaved by sudden unnatural deaths, risk of high guilt scores compared with those bereaved by sudden natural deaths was present only in non-relatives and not in relatives.

4.2.12 Sensitivity analyses

The final part of the analysis tested the robustness of my findings, and the results of sensitivity analyses in relation to four areas of uncertainty are presented below.

4.2.12.1 Missing data

Worst case scenario and best case scenario analyses were conducted in relation to all outcomes, and separately in relation to the 2 covariates that had just over 6% missing data: family history of non-index suicide (7.0%) and pre-loss self-harm (7.0%). Under each scenario, findings were as for the main analysis in relation to both primary outcomes. The magnitude of the risk of suicide attempt in people bereaved by suicide relative to natural deaths was relatively unchanged (by a maximum of 0.1).

For secondary outcomes, the only finding that varied was that for risk of poor social functioning in those bereaved by suicide compared with those bereaved by sudden natural deaths under a worst case scenario for missing data on this outcome. In the main analysis there had been an increase in risk of borderline significance, which was judged to be weak evidence for a difference (327). Under a worst case scenario for all missing data on social functioning, risk was significantly increased in those bereaved by suicide (AOR=1.39; 95% CI=1.11-1.74; p=0.004) relative to natural deaths. This reflected an increase in risk magnitude of 0.06 from an AOR of borderline significance (AOR=1.33; 95% CI=1.06-1.67; p=0.012). For all other associations between exposure and secondary outcomes in the main analysis, their magnitude remained relatively unchanged under worst case or best case scenarios.

Given that my findings appeared robust to worst case and best case scenarios for missing values, there was no indication to proceed to multiple imputation.

4.2.12.2 Selection bias

After excluding all respondents from the 10 HEIs that had used variations on the stipulated recruitment method (n=918), analysis of primary outcomes in relation to the remaining sample of 2,514 showed that the main findings were unchanged

4.2.12.3 Variable cluster size

After excluding the 98 individuals from 9 HEIs in which the cluster size was <=21 (the median value), repetition of the analysis for primary outcomes in relation to the remaining sample of 3,334 showed that the main findings were unchanged.

4.2.12.4 Ineligible respondents

To test whether ineligible respondents had biased the findings, analysis of primary outcomes for the sample aged 18-37 (n=3,189) to exclude those aged 38-40 (n=304) indicated that the main findings were unchanged.

4.2.12.5 Post-hoc sensitivity analyses

Group differences in relation to sample characteristics guided two further sensitivity analyses. Firstly, as 86% of the sample constituted students, I repeated the analysis using a student only sample (excluding staff). Results were unchanged, but the magnitude of the risk of suicide attempt in those bereaved by suicide compared with bereavement by natural causes was greater than that in the full sample (AOR=1.92; 95% CI=1.20-2.83; $p<0.001$). Secondly, as it was more common for those bereaved by natural causes to report the loss of a grandparent (31%), and more common for those bereaved by suicide or sudden unnatural causes to report the loss of a friend (41% and 38% respectively), I repeated the analysis excluding all 769 bereavements due to the death of someone over 60. This was conducted to explore whether the excess of grandparental deaths by natural causes, and the possibility of them being less unexpected, explained the excess risk of suicide attempt in those bereaved by suicide compared with natural causes. The results were unchanged from those in the full sample.

4.2.13 Qualitative data

Of the n=4,630 individuals consenting to take part n=2,755 people provided responses to the qualitative questions at the end of the survey, of whom n=495 were bereaved by suicide. As described under Methods, interviews were conducted with n=27 people selected using purposive maximum variation sampling of those in all three bereavement groups, until saturation of themes was achieved. These qualitative data will be analysed in the post-doctoral period, using a process of thematic analysis (293), as described in the Methods section (see 3.20.2).

Chapter 5 Discussion

The first part of this chapter compares the findings of my qualitative preliminary study to those of other published studies of sudden bereavement, and explains in more detail how these findings influenced the topic guide for the qualitative interviews that followed my main cross-sectional survey. The second part of this chapter summarises the main findings and implications of the cross-sectional study, exploring alternative explanations, strengths and limitations. It sets these findings in the context of other published studies and describes plans for future work.

5.1 Qualitative preliminary study findings

The preliminary qualitative study identified four themes in the free text responses of adults of all ages bereaved suddenly: 1) negative or stigmatising attitudes; 2) avoidance of the bereaved person and the topic of the death; 3) concealment of grief after a sudden bereavement; and 4) lesser support for outer circle of bereaved people. This first theme was not specific to suicide, and negative attitudes were also apparent towards people bereaved by accidental and sudden natural deaths. There appeared to be a stigma associated with profound grief as well as with bereavement due to a violent cause of death. This is consistent with the finding from my main cross-sectional survey of young adults, showing that self-perceived stigma (a measure including items on others' avoidance) was reported by those in all three bereavement exposure groups. Other surveys have also recorded self-reported stigma in those bereaved by a range of causes, particularly violent deaths (132)(219)(234)(241).

The second theme of avoidance of the bereaved person and the topic of the death is consistent with qualitative research with offspring after parental suicide (168). This revealed a tendency not to discuss the death within the family, to conceal the true cause of the death, and to remove the dead parent's personal possessions, almost as if denying their existence (168). The third theme of concealing grief was also apparent in the same study of parental suicide, in which offspring described hiding their grief from the surviving parent and keeping this up for many years to avoid awkwardness and upset (168). The fourth theme, that more peripheral members of the social circle felt poorly supported, has not previously been reported, and highlights the importance of investigating risk and access to support in a wide range of kinships.

This theme was therefore probed in the face-to-face interviews, and these data will be analysed during my post-doctoral fellowship.

5.2 Cross-sectional study findings

5.2.1 Summary findings

Hypothesis-testing found that when compared with young adults bereaved by sudden natural deaths, young adults bereaved by suicide experience:

- a similar risk of suicidal thoughts post-bereavement
- ↑ risk of suicide attempt post-bereavement (which may be explained by stigma)
- ↑ risk of drop-out from work or education (which was not explained by pre-loss drop-out but may be explained by stigma)
- a similar risk of incident depression, non-suicidal self-harm, and poor social functioning
- ↑ risk of self-reported stigma, shame, responsibility and guilt

When compared with young adults bereaved by sudden unnatural deaths, thereby effectively controlling for the violent nature of the death, young adults bereaved by suicide experience:

- a similar risk of suicidal thoughts and of suicide attempts post-bereavement
- ↑ risk of poor social functioning (which may be explained by stigma)
- a similar risk of drop-out from work or education, non-suicidal self-harm, and incident depression
- ↑ risk of self-reported stigma, shame, responsibility and guilt

For all the associations identified, risks were elevated in both relatives and non-relatives. As my adjusted model included past suicidal and non-suicidal self-harm, the results indicate that people bereaved by suicide have an excess risk of suicide attempt when compared with those bereaved by natural causes that is not explained by previous suicide attempts. The only outcomes distinguishing the suicide-bereaved from those bereaved by other violent deaths were greater difficulties in day-to-day

functioning (which may predate the bereavement, as discussed below – see 5.3.3.7), and increased stigma, shame, responsibility and guilt, indicating that both had a similar risk of suicide attempt.

5.2.2 Robustness of findings

Use of sensitivity analysis to account for non-response and selection biases showed that the above findings were robust to the differing scenarios.

5.2.3 Main implications

The contribution of this research is that it supports an existing theory, previously unsupported with UK evidence, that people bereaved by suicide are vulnerable to suicide attempt. Moreover, it also derives a new theory that people bereaved by non-suicide violent deaths are at a similar risk of suicide attempt. By controlling for past suicidal behaviour, a family history of non-index suicide, and kinship to the deceased, the study provides evidence to support violent bereavement being a specific environmental risk factor for suicide attempt, both among relatives and non-relatives. Care should, however, be taken in the interpretation of any findings due to the difficulties in separating out familial and environmental contributions, and the possibility of residual confounding. The findings have relevance at the individual level with respect to exploring interventions likely to be acceptable and beneficial, and at the population level with respect to service-planning and prevention programmes in relation to the stigma of violent death.

5.2.4 Secondary hypotheses

5.2.4.1 Risks intermediate for group bereaved by sudden unnatural causes

Another secondary hypothesis, that those bereaved by sudden unnatural causes would show risks intermediate to the groups bereaved by sudden natural causes and suicide, was supported only in relation to the outcomes stigma and shame. Participants bereaved by suicide had the highest risks of stigma and shame, followed by those bereaved by sudden unnatural causes, and lastly those bereaved by sudden natural causes. For all other outcomes there were no differences in risk between those bereaved by sudden unnatural causes and those bereaved by sudden natural causes. The clinical significance of these differences in stigma and shame

coefficients is discussed later in this chapter, in the context of other studies (see 5.4.7).

5.2.4.2 Stigma as a possible explanatory factor

Another secondary hypothesis was that self-perceived stigma explained any excess risk of adverse outcomes in the suicide-bereaved. This was supported in relation to all three relevant outcomes, such that all excess risks became non-significant when adjusted for higher stigma scores:

- ↑ risk of suicide attempt in young adults bereaved by suicide compared with sudden natural causes
- ↑ risk of drop-out from work or education in young adults bereaved by suicide compared with sudden natural causes
- ↑ risk of poor social functioning in young adults bereaved by suicide compared with sudden unnatural causes

However, in any such test for possible explanatory factors it remains possible that the putative variable is not the sole mechanism or is merely a marker for another covariate associated with both stigma and the outcome. Other possible mechanisms include hazardous alcohol use (which was not measured in this study) and depression. In this study risk of depression was also hypothesised to be increased after suicide bereavement compared with other bereavements, and it could be hypothesised that an elevated risk of depression explains the increased risk of suicide attempt. However as I found no group differences on depression this explanation is unlikely. Given the young sample, romanticisation was possible as an alternative explanatory variable. Young people are thought to be at risk of emulating suicidal behaviour where they perceive a romance, glamour or heroism associated with a suicide death (94), and for this reason media guidelines advise against romanticising suicide (93). As it was not possible to measure romanticisation, its role might be better explored using qualitative methods.

Stigma might also be a marker isolation or lack of support. In this case it might be theorised that lower levels of support for the suicide-bereaved account for their greater risk of adverse outcomes. My cross-sectional study did not include an

objective measure of **support received** due to the lack of standardised instruments. The difficulties in measuring levels of support were described in my Introduction. Although I did include a subjective measure of receipt of help after the bereavement, which did not differ significantly between groups, this variable did not capture quality or quantity of support. The GEQ stigma subscale does include perceptions of the support offered; asking respondents to rate whether they had felt avoided by friends, whether no-one cared to listen to them, and whether people had been uncomfortable offering their condolences. My data also showed an association between high levels of perceived stigma in relation to the death (using stigma dichotomised at the median) and low likelihood of receiving help after the death ($p=<0.001$). However this relationship was not hypothesised *a priori*, and does not distinguish whether the reduced likelihood of receiving support was due to reduced offers of help or reduced requests for help.

My systematic review (102) found that there was contradictory evidence as to whether people bereaved by suicide experienced a differential loss of support (219) (234), as have other reviews (13), and this is likely to be due to widespread use of unstandardised instruments. Whilst routine databases record health service utilisation as an objective measure of help received, this would not include lay or voluntary sector support or an assessment of quality or satisfaction. It is therefore difficult to test whether lower levels of support in the suicide-bereaved explain their excess risk of suicide attempt and drop-out from work or education in relation to those bereaved by sudden natural causes, and of poor social functioning in relation to those bereaved by sudden unnatural causes.

It was also striking that although my final model showed no group differences in incident depression using either reference category, the following were observed when I added stigma routinely to the final model:

- significantly ↓ risk of incident depression in those bereaved by suicide compared with sudden natural causes
- significantly ↓ risk of incident depression in those bereaved by suicide compared with sudden unnatural causes

There are various explanations for the apparent behaviour of stigma in these relationships. It may be that those who feel most stigmatised ascribe depressive symptoms to the experience of stigma rather than to a depressive disorder. It is also possible that when a lack of support is taken into account, those bereaved by suicide have better resources for combatting depression than the other two groups. The particular understanding shared with other people bereaved by suicide (13), for example those encountered in suicide support groups, may compensate for a lack of support in a bereaved person's usual network. However this would need further exploration using qualitative approaches to investigate preferences for support.

5.2.4.3 Stratification by kinship

Testing for an interaction with kinship showed that there was a significant interaction with exposure only in relation to guilt, and this interaction related to differing magnitudes of coefficients rather than to the presence or absence of risk *per se*. The interaction in relation to guilt was apparent when comparing those bereaved by suicide with either reference category, with the p-value of 0.002 for each comparison presenting strong evidence for an interaction. In other words, when stratifying the sample into relatives and non-relatives, any elevated risks of adverse outcomes associated with suicide bereavement were present in both relatives and non-relatives of the deceased. Given the number of outcomes for which a test for interaction was conducted (10 outcomes *x* 2 reference categories), and the limited power of interaction tests to detect such an effect, it is possible that this finding was due to chance (313).

Explanations for the observed interaction with kinship in relation only to guilt are largely conjectural. While stigma and shame might be regarded as affective states arising from a person's negative self-evaluation of their whole self, and influenced by public disapproval, guilt and responsibility can be regarded as arising from a person's negative evaluation of their past behaviour, usually in relation to another's welfare (328). Guilt and a sense of responsibility are common human experiences after transgression of one's own code of values. In a study of bereavement, levels of guilt or responsibility are likely to be influenced by perceptions of the preventability of the death, expectedness of death, and of kinship role. Personality factors may also be involved, given the potentially narcissistic dimension to guilt in its assumptions of

omnipotence and indispensability. In this study guilt and responsibility were investigated not so much as pathological outcomes but as a means of understanding patterns of risk differences in the dimensions stigma and shame.

The additional observation that the ranking of the magnitudes of the coefficients for guilt differed depending on the comparison group was also likely to be a chance finding. It is important to acknowledge that the statistical test for interaction did not assess the significance of these differences in magnitudes of risk. To explore the effect of different bereavement exposures on different kinship groups would require a larger study testing this specific hypothesis. To summarise this observation, when bereavement by suicide was compared with bereavement due to sudden natural causes, risk of reporting high levels of guilt were significantly elevated in each stratum but the magnitude was greater in non-relatives than relatives (AOR=2.76 *versus* AOR=1.74). When the suicide-bereaved group was compared with that bereaved by sudden unnatural causes, again risks were significantly elevated in each stratum, but the magnitudes of the risk were reversed such that it was greater in relatives (AOR=2.08 *versus* AOR=1.84).

Explanations for the differing magnitudes of risk between relatives and non-relatives bereaved by the same cause are again purely conjectural. These might include group differences on measured variables such as age at bereavement (as a proxy for idealism and notions of death preventability) and closeness to the deceased (as a proxy for an understanding of how entrenched a person's hopelessness had become), or on unmeasured variables such as carer burden. It is possible that when compared with bereavement by natural causes, suicide-bereaved relatives may have had a tendency to blame friends of the deceased for negligence in not alerting family to the risks. In comparison with people bereaved by non-suicide violent causes, suicide-bereaved relatives may feel more responsible than suicide-bereaved non-relatives in failing to prevent the suicide of a family member. In the overall sample, those who were related to the deceased were significantly more likely to report themselves as closer ($p=<0.001$) than non-relatives. These findings suggest that feelings of guilt relate both to the cause of death and to kinship; themes that could be explored further in qualitative work to probe the issue of guilt.

A final observation in relation to stratification, again possibly a chance finding, was that for those bereaved by unnatural causes, stratification showed an association with high guilt scores to be present only in non-relatives. Whilst in the unitary sample of mixed kinships there were no differences in risk of perceived guilt in those bereaved by sudden unnatural compared with natural causes, stratifying by kinship revealed that that an association was present in non-relatives bereaved by sudden unnatural causes, who were significantly more likely to report guilt (AOR=1.50; 95% CI=1.20-1.87; p=<0.001) than non-relatives bereaved by natural causes. The magnitude of this risk was intermediate to that for non-relatives bereaved by suicide when compared with bereavement by natural causes. Explanations for why risk of reporting guilt might be increased in non-relatives but not among relatives bereaved by unnatural causes are also conjectural, and include the tendency for peer groups (but not relatives) to engage in risk-taking behaviour similar to the cause of death, or the tendency for the deceased to have confided in peers but not relatives as to their risk-taking behaviour.

5.3 Alternative explanations for findings:

5.3.1 Role of chance:

It remains possible that this study was underpowered to detect a true difference and that chance or type I error might account for the differences observed. It is also possible that the testing of ten outcomes using two different baseline comparisons may have increased the possibility of type II error due to multiple comparisons. However, this study has a clear emphasis on two primary outcomes, and used a more stringent significance threshold of p=0.01 for the 8 secondary outcomes. Group sizes exceeded those required to achieve adequate power, even where cases were dropped in the process of listwise deletion (maximum of 11%), as discussed below under missing data (see 5.6.6). Therefore it seems unlikely that my findings are simply explained by chance.

Another possibility is that the heterogeneous mix of kinships in each group may have increased the possibility of Type II error if effect sizes within one kinship group were obscured by a lack of effect size in other kinship groups, such that heterogeneous scores resulted in no difference observed. This was partly mitigated by testing for an

interaction with kinship, dividing the sample into strata of those related and unrelated to the deceased. However, it remains possible that effect sizes vary by specific kinship group, as was apparent in my systematic review where spouses and mothers bereaved by suicide stood out as two kinship groups with an increased risk of fatal suicide attempt (102).

5.3.2 Residual confounding:

It is possible that the elevated risks observed could be explained by residual confounding from:

- un-measured positive confounders
- measured covariates that were not included in the model
- covariates included in the model that were insufficiently precise (for example using five categories for social class instead of the original nine)

Examples of positive confounders might include, for example, a greater tendency for those bereaved by suicide to be exposed to other environmental stressors, such as financial difficulties, or drug and alcohol use, or to carry traits for risk-taking. This study did not measure financial variables, apart from qualitative data on the impact of the bereavement on finances. It is possible that financial hardship is associated with both exposure to suicide bereavement and adverse outcomes. Whilst this was partially accounted for by controlling for socio-economic status, this variable was largely derived from parental occupation and is not a direct measure of relative hardship.

The level of expectedness of the death is another potential positive confounder, but this was also not measured in this study. A third of the group bereaved by sudden natural causes reported the death of a grandparent, and this was significantly greater than the 5% of those in the other two groups, who were more likely to report the death of a friend (approximately 40%). It might be argued that the death of someone in old age might come as less of a shock than that of a young person. Sensitivity analysis (see 4.2.12.5) showed that results were unchanged when excluding all bereavements due to the death of someone over 60. This would suggest that the significant risk of suicide attempt among the suicide-bereaved compared with those

bereaved by sudden natural causes was not explained by the greater expectedness of the death of an older person from natural causes.

Residual confounding may affect interpretation of my finding that stigma explained the risk of adverse outcomes in the suicide-bereaved. Other potential explanatory factors include irresponsible reporting of suicide in the media, given evidence that this can have imitative effects on suicidal behaviour and completed suicide (94;329) through a process of social modelling (330). This is particularly strong in relation to newspaper reports (94), non-fictional accounts (331), dramatic or unusual circumstances (332), and repetitive coverage (94;333). If those bereaved by suicide in this study were also exposed to irresponsible reporting of that suicide, it is possible that this may have been the explanation for the excess risk of suicide attempt.

5.3.3 Possible biases

5.3.3.1 Inductive bias

The tendency for researchers to introduce assumptions into the research design was countered by seeking the advice of bereaved people and bereavement counsellors on developing the study method and neutral wording of the questionnaire. Use of two-tailed analysis accommodated the possibility of positive outcomes after suicide bereavement, which have previously been more apparent in qualitative than quantitative research. The choice of outcome measures in this study may have restricted the potential to capture positive outcomes. My study lacked variables such as financial stability, carer burden, and life satisfaction, all of which might improve after specific bereavements.

5.3.3.2 Selection bias

This study used a precise sampling frame, and allowed access to a large sample of young adults, who are generally a hard-to-reach population in health research terms. However, it is likely that selection bias arose in relation to the characteristics of 18-40 year olds working or studying at UK HEIs *versus* those not doing so. The sample cannot therefore be said to be a random sample, and the results may only be generalisable to staff and students in UK HEIs.

Despite a high level of entry (46%) into higher education among 17-30 year-olds at the time of conducting the study (257), and the increasing social and cultural diversity of this group (334), this cohort would not be regarded as representative of the whole population of 17-30 year-olds. This is reflected in the participant characteristics, such that 62% self-identified as identified as social classes 1 & 2 (62%), and 66% reported good social functioning (66%). Inclusion of staff and post-graduates meant that overall 56% of the sample was educated to at least undergraduate degree level. Although staff members (14% of the sample) were more likely to be in higher social classes than students, they had similar levels of lifetime psychological morbidity.

There is also clear potential for the healthy worker effect (335) to operate in a sample of this kind, because the method excluded those exposed to traumatic bereavement who were too unwell to work or study. This would also apply to those who had already died by any cause, of which suicide or accidental death would be the most likely cause in this age group. Given that my systematic review of risk factors for suicide in young men (145) (see Appendix 4) had identified psychiatric illness, substance misuse, and lower socio-economic status, as individual-level risk factors for suicide, the population sampled might be regarded as lower risk for suicide.

Such biases might serve to over- or under-estimate the risk of specific adverse outcomes. The non-inclusion of those bereaved people who had already died by suicide would serve to under-estimate the risk of suicide attempt in those at highest risk. The non-inclusion of young bereaved men in lower socio-economic groups and with substance misuse or psychiatric illnesses would also serve to under-estimate the risk of suicide attempt in those at highest risk. The inclusion of those with high baseline levels of social functioning might serve to over- or under-estimate the risk of adverse outcomes. This is because those with high baseline levels of social functioning might have greater resilience to the effects of exposure to trauma, resulting in an under-estimation of the population risk of suicide attempt or depression. Conversely, a HEI-based sample with high baseline functioning might show a tendency to catastrophisation (for example over a perceived decline in academic achievement) and this might result in an over-estimation of the population

risk of suicide attempt or depression. High social confidence may buffer the effect of stigmatising attitudes, resulting in an under-estimation of stigma or shame.

Study design features mitigating these biases included deriving controls from the same sample, so that any such characteristics were equally distributed between comparison groups, and adjusting the analysis for socio-economic status. However the potential for these selection biases suggest that students and staff of universities might constitute a sample with a higher level of income, education and social functioning than the general population. These selection biases raise the question of external validity, and how appropriate it would be to generalise the findings of this large sample to non-HEI populations. We recognise that the results may be generalisable only to those studying or working in UK HEIs and not to the UK general population. This in itself has value given concerns about the mental health of students (334;336-338) and the clear demand for policy responses (336). As this study constitutes the largest and most representative sample of any UK epidemiological study of the impact of suicide bereavement to date, and indeed the only one measuring suicide-related outcomes, the findings do have utility in clinical practice by constituting the best available evidence. It should also be noted that with increases in student fees decreasing the numbers of people who can afford tertiary education, future studies using the email sampling method within HEIs will become decreasingly generalisable to the general population.

It is also possible that generalisability of findings was limited to some degree by other aspects of the sampling process. For example, this study sampled UK-domiciled staff and students but did not specify country of origin or immigration status. The proportion of non-UK citizens cannot therefore be estimated. The rationale for this lay in minimising the proportion of legalistic questions to reduce drop-out, but does limit assumptions on how generalisable the findings are to non-UK residents.

Responses from those ineligible to participate, including hoax (non-bereaved) respondents, would reduce generalisability to young adults. Factors countering this included the length of the questionnaire, and exclusion from the analysis of those who did not complete at least one outcome measure (usually achieved by reaching

the GEQ at question 63 out of 120). The questionnaire also contained branching restrictions to exclude: a) those not studying or working in any of the 37 HEIs sampled; b) those aged under 18 or over 40; and c) those bereaved before the age of 10. Nevertheless repeated trials by someone who was determined to participate would have overcome these barriers.

An unexpected bimodal distribution of age (with peaks at 21 and 40) suggested that some respondents were over 40 but had provided a fabricated upper-limit age. Sensitivity analysis excluding the n=304 respondents aged 38-40 showed that findings for primary outcomes were unchanged; thus weakening support for this hypothesis.

One final aspect of the sampling method may have introduced a selection bias. The study protocol had specified that sampling would involve a specific email to each student and staff member in the 37 participating HEIs, but 10 HEIs chose to vary this (using a weekly email digest, the intranet, inviting students only, or using different methods for students and staff). This was largely because of anxieties about exposing students and staff to a direct email about a potentially distressing topic, and may have identified a sub-group of HEIs in which there had been recent suicides. Deviation from the direct email recruitment protocol was reflected in the reduced responses from those HEIs (see Appendix 6b: Table of responses by HEI), suggesting under-representation of HEIs most affected by bereavement. It could also suggest a non-response bias from those who were most distressed, as described below. Excluding participants from these 10 HEIs had no impact on my main findings, suggesting that any selection biases introduced by those variations had been minimal.

5.3.3.3 Contamination

As in any bereavement survey not using coroner records, verification of exposure was impossible. However the purpose of this study was to relate outcomes to the state of perceiving that one had been bereaved by suicide. Participants defined the mode of bereavement themselves, minimising the exposure misclassification that could have arisen in this case from use of a coroner's verdict. It was, however, possible that those who considered themselves greatly affected by a traumatic

undetermined death might have been more likely to have labelled it as suicide than as an unnatural death.

5.3.3.4 Non-response bias

It is likely that non-response bias operated with respect to four factors: gender, socio-economic status, distress, and relationship to the deceased.

Gender: We expected the use of internet-mediated research methods to counter the tendency for females to be over-represented in psychosocial health surveys (169) and specifically bereavement surveys (168). However, only 20% of respondents were male; a gender bias observed in other surveys of suicide bereavement (82) (216). To a very minor extent this could be explained by the excess of females in the student sampling frame, given that the HEI student population during the 2009/10 academic year (https://www.hesa.ac.uk/intros/stuintro0910) comprised 57% females and 43% males (258). However it is more likely that this pronounced non-response bias from men was explained by psychological factors.

Firstly it is acknowledged that there is a greater reluctance among men to participate in research of this kind (168;169), and perhaps even more so when it relates to sudden violent bereavement. Women may seek self-awareness in completing a survey of this kind, whereas men may derive no benefit from sharing their feelings in an anonymous forum. There are also likely to be gender differences in levels of social support and the nature of social networks. Women are likely to look more widely for support, and encounter greater opportunities for help, while men may rely on one close confidante. A differential lack of support for bereaved males may result in them having worse outcomes, and not feeling able to cope with the task of completing a survey.

It is also possible that men were exposed to a greater dose of exposure to sudden bereavement, and this had differentially affected their levels of functioning. This assumption is based on the epidemiology of suicide (12;110) and accidental death (145;161) over the period of sampling, which would suggest that crude numbers of suicides and accidental deaths among young and middle-aged men would expose a great many male peers, male and female partners, siblings, sons and daughters to

violent bereavement. In view of the additive effect of male peer suicide and paternal suicide, it may be that men rather than women in this sampling frame would have had the greatest exposure to suicide bereavement. Finally, the under-representation of bereaved men might partly be explained by some having died by suicide already, particularly with the additive risk factors of male gender, young age, and exposure to traumatic bereavement.

Together these factors suggest that some of the young men invited to (and eligible to) participate may have found the prospect of involvement too distressing. Even those men who were not greatly distressed by the idea of responding may have been influenced by cultural stereotypes dissuading men from sharing their emotional experiences. Indeed the 647 men included in the analysis might reflect a sub-sample of emotionally expressive men (339) rather than wider samples of bereaved males.

For this reason, there are limits to the generalisability of these findings to young bereaved men. This is a key methodological concern because suicide-related outcomes were the primary focus of the study, based on the 2002 suicide prevention strategy for England in which young men were regarded as the group at highest risk of suicide (12). It is also an issue because my systematic review identified evidence that there are gender differences in the type of help received after a death (340). It would have been desirable to have had greater representation of men to allow both a quantitative and qualitative exploration of their help-seeking behaviour and preferences.

Socio-economic status: It is possible that non-response bias operated with respect to socio-economic factors at four levels: in relation to the HEIs that consented to participate, the respondents within these HEIs who elected to participate, the respondents who completed the survey, and the pattern of missing values within responses. Firstly, although all 164 UK HEIs were invited to take part, the 37 (23%) agreeing to take part were likely to have been those with the best resources. The response from well-funded Russell Group HEIs (40%) was double that of non-Russell Group HEIs (20%), resulting in 22% of participating HEIs having Russell Group membership compared with 14% nationally in 2010. Secondly, on an individual invitee basis, it was possible that there was tendency for those responding

to derive from higher socio-economic groups, such as is observed in other bereavement surveys (82;229;230;242). However, without socio-economic classifications for all those eligible to respond this was impossible to verify. Thirdly, statistical comparisons of those who provided at least one outcome and those who dropped out before completing the survey demonstrated a bias towards respondents who were educated to a higher level, of a higher social class, and with less sickness absence. There was also a bias towards those who were white and female. Fourthly, and conversely, statistical comparisons of those with missing data on psychopathological variables indicated that those from higher social classes 1 & 2 were significantly more likely to have missing data.

Distress: The tendency for either the least-affected (healthy volunteer effect) or worst-affected individuals to participate in a voluntary survey is well-recognised (335), and creates a non-response bias in that participants differ from non-participants on key outcomes. The consequences of each are to underestimate or over-estimate (respectively) any risks associated with the exposure, and this is common to many such cross-sectional studies. My questionnaire may have been perceived by those worst-affected as too intrusive, or too distressing for them to complete, or conversely they may have been more likely to perceive it as an opportunity to report their distress. Previous studies assessing participants' experiences of taking part in bereavement research have shown it to be tolerated well, and even therapeutic in providing an opportunity to ventilate (268;341-343). It is also possible that those who responded had a specific coping style, namely a preference for confiding and sharing. Given the possibility of a non-response bias in relation to distress operating in both directions, and the difficulties of assessing this, no firm conclusions can be drawn on this issue.

Closeness: In the Methods section my consideration of covariates for inclusion in the model referred to the greater tendency for respondents bereaved by suicide to describe being less close to the deceased than those in the two other groups. I had discussed (see 3.18.4) whether this represented a non-response bias in terms of 'closeness' thresholds. There were no differences between groups in relation to a family history of suicide other than the index bereavement. However this survey did not measure the number of exposures to each type of bereavement, and it was

possible that those bereaved by suicide may have been more likely than the other groups to have been exposed to more than one index bereavement. Past violent bereavements, even of individuals not very close to the respondent, may have primed suicide-bereaved respondents to take part in the survey regardless of closeness to the deceased. This is suggested by the observation that 88/614 (14%) of the group bereaved by suicide had been exposed to all three types of sudden bereavement. In case such variables had confounded the unadjusted associations, I accounted for these in the final model through inclusion of kinship (weakly collinear with closeness to the deceased) and family history of non-index suicide. However if such group differences reflected genuine non-response biases these would be impossible to account for statistically.

5.3.3.5 Reporting bias

Social desirability effects were reduced by use of an anonymous internet questionnaire, but it remained possible that denial or the stigma associated with mental disorder (46) may have resulted in under-reporting of depressive symptoms, social dysfunction, drop-out from work or education, past psychiatric history, a family psychiatric history, or a family history of suicide. The observation that respondents from social classes 1 & 2 were significantly more likely to omit questions on psychopathology than those in social classes 3-7 & 9 (7% *versus* 5%; p=0.033), supports the involvement of reporting bias. My final model adjusted for socio-economic differences but it is possible that residual bias resulted in an under-estimation of the risk of post-bereavement psychopathology, or that insufficient accounting for past psychological problems resulted in an overestimation of risks.

5.3.3.6 Recall bias

Five outcome measures (post-bereavement suicidal ideation, post-bereavement suicide attempt, post-bereavement non-suicidal self-harm, post-bereavement drop-out from work or education, and post-bereavement depression) required respondents to designate first whether they had a lifetime history of this parameter, and then to specify whether this was before, after, or both before and after the loss. Difficulties recalling the onset of each may have affected data reliability. It was possible that those affected by the more violent types of bereavement may have been more likely to remember negative outcomes, such as suicide attempts or job loss; to recall them

as occurring after the loss when in fact they had predated it; or to attribute suicidal intent to past acts of non-suicidal self-harm, particularly those occurring after the loss. Such recall biases would tend to over-estimate the risks of certain outcomes, but might be balanced if they also applied to the three clinical covariates included in the adjusted analysis: a family history of suicide, a history of pre-loss depression, and of pre-loss self-harm. The GEQ and SFQ require respondents to report current grief and functioning respectively, so are less subject to recall bias. Additionally, as the GEQ stigma subscale captures self-perceived stigma rather than episodes of overt discrimination, it is less subject to recall decay on specific events.

Recall biases occur in many cross-sectional studies of this kind, which lack the potential of routine sources of data such as linked population registries (28;56;59;60;70;71;100;101;193-197). These minimise problems of response bias or recall bias, while allowing adjustment for pre-bereavement covariates similarly unaffected by recall bias. The use of a young sample in this study reduced the recall period to a maximum of 30 years, minimising the potential for memory decay, as well as narrowing the period effect from cultural change (153).

5.3.3.7 Reverse causality

In all such cross-sectional studies there is the possibility of reverse causation, due to difficulties ascertaining the temporal order of exposure and the onset of adverse psychosocial functioning. This is particularly relevant where: a) pre-exposure functioning is associated with risk of exposure; b) there is a potential for recall bias; or c) no adjustment is made for pre-exposure functioning. All three of these issues applied to this study, as described below, and it was therefore difficult to ascertain definitively whether the onset of any adverse outcomes preceded or followed exposure.

My systematic review (102) had shown that factors such as genetic inheritance, assortative mating (in the case of partners) (60), or assortative relating (61) (in the case of friends) have a role in increasing the risk of violent bereavement among those with greater propensity to suicidality, educational disruption, occupational problems, or social difficulties. The potential for recall bias in relation to 5 outcomes (pre-bereavement suicidal ideation, suicide attempt, non-suicidal self-harm, depression,

and drop-out from work or education) were discussed in the preceding section (see 5.3.3.6). Social functioning was the only variable for which I was unable to adjust for pre-loss baseline, due to the lack of a standardised measure of pre-loss social functioning. This was therefore the variable for which the onset of difficulties was least reliable. Registry-based studies can establish temporal sequence only for variables recorded in routine data (59;60;71;100;101) but tend to lack measures of social functioning. A prospective survey design would overcome this problem by measuring baseline functioning, but is precluded given the low event rate.

Given the above three issues, the implications for causal inference were that it cannot be inferred that suicide bereavement causes adverse psychosocial functioning if such difficulties might precede the bereavement. These issues illustrate the problems of establishing the temporal sequence of events in cross-sectional studies.

5.4 Results in the context of other studies:

5.4.1 Demographic differences between groups

In this study there were no significant group differences in age of respondent, but a non-significant trend towards younger respondents being more likely to have been bereaved by sudden natural causes. The deceased person described in survey responses tended to have been younger in the groups bereaved by unnatural causes and suicide (mean=31) than those bereaved due to natural causes (mean=55). This is in keeping with the epidemiology of violent deaths, which peak in young adults, exposing their peers to sudden violent bereavement (145;161). Such age differences also correspond to those in US bereavement studies using adult samples (211) (344).

5.4.2 Suicidal thoughts and attempts

Few other studies using bereaved controls have investigated the impact of suicide bereavement on suicidality. My systematic review (102) identified a Danish study showing an excess risk of completed suicide in partners bereaved by suicide compared with partners bereaved by non-suicide deaths (60). However, risk of suicide in parents bereaved by the suicide of their offspring (of any age) was similar to that in parents bereaved by offspring non-suicidal death (60). The review also identified a study demonstrating an increased risk of maternal suicide after the

suicide of an adult child, in comparison with the non-suicide death of adult offspring (100). A Canadian study found no group differences in risk of suicide attempt between parents bereaved by a child's suicide and parents bereaved by a child's accidental death (71). There was very weak evidence, derived using unstandardised measures, that bereaved twins have an increased risk of suicide attempt and suicidal ideation (228).

My appraisal of studies investigating the impact of peer suicide among adolescents using non-bereaved controls indicated that exposure to peer suicide is associated with increased suicidality, but that this was apparent in large representative national samples and not local surveys prone to non-response bias (102). The finding of the study reported in this thesis of no differences in risk of suicide attempt between those bereaved by suicide and those bereaved by non-suicide unnatural causes is in keeping with Canadian registry-based data showing no significant differences in suicide attempt between parents bereaved by their child's motor vehicle crash and those bereaved by their child's suicide (71).

My finding of an excess risk of suicide attempt in the suicide-bereaved compared with those bereaved by natural causes, but without differences in suicidal ideation, non-suicidal self-harm or depression, is striking. The prevalence of suicidal ideation is relatively high in community samples (19%-21% lifetime prevalence in those aged 16-44 in England) (275), (3% past-year prevalence in the US) (345), among young people presenting for mental health care (16% screened positive in Australia) (346), and high-risk patients (66% during admission in England) (347), and it has poor predictive ability for future suicide (347). It may be that rates of suicidal ideation (and/or depression) are high in all groups of people bereaved suddenly, but that for violent bereavements imitative effects are particularly powerful in precipitating suicide attempt (but not non-suicidal self-harm) in a suicidal person (99). These imitative effects are described as volitional moderators in the integrated motivational-volitional (IMV) model of self-harm/suicidal behaviour (99). An alternative explanation is that suicidal ideation is more vulnerable to recall decay than suicide attempt, and that respondents had differentially under-estimated suicidal ideation.

5.4.3 Social functioning

My systematic review of studies measuring the effects of suicide bereavement showed that findings in relation to risk of social dysfunction were conflicting (192) (209) (136;242). In contrast, my cross-sectional study found an increased risk of poor social functioning in the suicide-bereaved when compared with those bereaved by sudden unnatural deaths but not when compared with those bereaved by sudden natural deaths (where the excess risk was of only borderline significance). There was a non-significant trend for those bereaved by sudden unnatural causes to have better social functioning than those bereaved by sudden natural causes. It is possible that risk-taking is associated with greater social confidence, and that through assortative mating or relating (60;61) those bereaved by accidental deaths have a tendency to high social functioning. These explanations are conjectural, and the direction of causality is anyway unclear due to the cross-sectional nature of the study.

Poor social functioning, alongside stigma, shame, responsibility and guilt, were the only outcomes distinguishing those bereaved by suicide from those bereaved by sudden unnatural causes. The increased risk of poor social functioning in those bereaved by suicide appeared to be explained by stigma. It is possible that the stigma associated with suicide bereavements inhibits social confidence, and it is this that reduces social functioning. However the SFQ taps dimensions other than relationships, such as household and work tasks, money problems, and sex life, as well as relationships. It is difficult to see how stigma might affect all of these, unless stigma is a marker for reduced social support, as discussed above (see 5.2.4.2). Another explanation is that the observed differences in social functioning predated the bereavement, perhaps due to assortative mating or relating (60;61) or carer strain. It was not possible to adjust for pre-bereavement social functioning using this cross-sectional study design, as discussed above (see 5.3.3.7).

5.4.4 Post-bereavement non-suicidal self-harm

My systematic review (102) did not identify any studies that had investigated non-suicidal self-harm as an outcome measure. As described above there were no group differences on non-suicidal self-harm or on suicidal ideation in this study, even where suicide bereavement was shown to be associated with a greater risk of suicide

attempt. Previous work in England has shown that non-suicidal self-harm is associated with suicidal ideation in adolescents (302), suggesting that this should also be considered a risk factor for suicidal behaviour. It is possible that risk of both outcomes was elevated in all three groups compared with a non-bereaved sample, but as described above, this could only be tested using 2007 APMS data to allow formal statistical comparison with a non-bereaved control group of a similar age (275).

5.4.5 Post-bereavement incident depression

My finding of no differences between groups in relation to post-bereavement incident depression are consistent with those of the only other UK-based study, which found similar depression scores when comparing individuals bereaved through suicide and those bereaved through natural causes (132). However it contrasts with those of a Canadian study showing that parents bereaved by their child's death in a motor vehicle crash had a significantly increased risk of depression than parents bereaved by their child's suicide (71). Although the Canadian data showed no differences in post-bereavement specific mental disorder, parents bereaved by suicide had a significantly increased risk of hospitalisation for mental illness ($p=0.049$) (71).

It should be noted that my study recorded post-bereavement past depression only in those reporting bereavement >6 months previously, because of the wording of the CIDI lifetime depression screen to exclude any symptoms in the last 6 months (271) (272). This excluded 14% of respondents, and therefore findings cannot be generalised to recent bereavements. Changes to diagnostic classifications mean that depression can now be diagnosed 2 weeks after bereavement rather than 2 months (40). Evidence for a time decay effect on adverse outcomes following bereavement (30;164;310;342) suggests the possibility of group differences in depression emerging and disappearing within the 6 months following bereavement. This would require re-testing using a different depression screening tool, or indeed using repeated measures.

5.4.6 Post-bereavement drop-out from work or education

No other published studies have measured the impact of sudden bereavement on occupational functioning, job retention or continuance of education/training.

However the relevance of this to workforce productivity suggests a need for further work to validate my findings, and to validate the measure designed for this study. As this was a relatively young sample (mean age 25.0) rates of pre-loss drop-out were low (mean 3.6%), but not significantly different between groups so this low rate was equally distributed. Published literature suggests that in samples bereaved at a later stage in life higher baseline rates of pre-loss drop-out might be expected in those bereaved by suicide (71;208), but this might be partially explained by baseline physical and mental illness (71).

5.4.7 Self-perceived stigma, shame, responsibility, and guilt

My study found that those bereaved by suicide reported perceiving significantly greater stigma, shame, responsibility and guilt in relation to the death both when compared with those bereaved by sudden natural causes and those bereaved by sudden unnatural causes. Those bereaved by sudden unnatural causes reported significantly greater stigma and shame scores than those bereaved by sudden natural causes, but were no different on measures of responsibility or guilt. When using those bereaved by sudden natural causes as the baseline group, stigma and shame scores for those bereaved by sudden unnatural causes were intermediate to those for the group bereaved by suicide (the group with the highest scores) and those bereaved by sudden natural deaths.

The clinical significance of the difference in magnitudes of the coefficients for stigma and shame are unclear. Predictive ability has not been demonstrated for these GEQ sub-scales in terms of subsequent depression, complicated grief or other impacts on life. No threshold values have been suggested in relation to the GEQ subscales, as this might be considered artificial. Each scale might best be regarded as a reflection of a bereaved person's emotions and how much of a problem they perceive each dimension to be.

These findings are in keeping with those of my systematic review (102) showing that people bereaved by suicide report higher scores on dimensions such as stigma, responsibility, shame, and rejection (88)(132)(234;241), and that when compared specifically with those bereaved by violent causes of death they report significantly higher scores on rejection (219) and shame (88;234). However it is important to note

that the findings in those studies were not fully adjusted for potential confounders. Other studies using GEQ subscales (i.e. specific validated measures of these grief dimensions) have found an excess of perceived stigma in the suicide-bereaved accompanying an excess of shame (132;234;241) and responsibility (234) (241), but not guilt. Thus, the study that is the focus of this thesis is the only one to date that has found an elevated risk of self-perceived guilt after a suicide compared with violent and non-violent sudden bereavements, and the only one to find an excess of guilt co-occurring with an excess of stigma, shame or responsibility.

5.4.7.1 Subjective stigma

Explanations for why the suicide-bereaved feel more stigmatised than other groups may relate either to self-perceived stigma (subjective stigma), described here, or to experiences of overt discrimination (objective stigma) (85), as outlined below, or indeed both.

The GEQ stigma subscale captures subjective perceptions that others treat one differently because of the way a friend or relative died. Respondents are asked whether they were avoided or shunned, gossiped about, or neglected for support. As perceptions of being stigmatised are likely to be influenced by feelings of shame, responsibility and guilt, it is not surprising that increased risks of all four dimensions co-occur in the suicide-bereaved in this sample. However, high ratings of self-perceived stigma may not reflect objective discrimination, even if my qualitative interview data contained many examples of this. Interviewees bereaved violently provided many examples of people ignoring them after their loss, for example crossing the road to avoid them or failing to acknowledge their absence from work, leaving them feeling very isolated. We can only assume that increased GEQ stigma subscale scores are also a marker for objective discrimination, and that this reinforces their sense of self-perceived stigma.

5.4.7.2 Objective stigma

There are broadly two reasons why members of the public might tend to shun people bereaved violently. Firstly they may lack the social competence to know how to respond, resulting in embarrassment and avoidance. Secondly, they may have conscious or unconscious prejudices against the friends and family of those who die

by suicide, for cultural reasons, a fear of contagion, or due to beliefs about blame or responsibility.

5.4.7.2.1 Embarrassment of others

The taboo around death, particularly by violent or horrifying causes, may cause embarrassment in others through a fear of violating social rules (87). The examples of avoidance given above (see 5.4.7.1) deriving from my qualitative interview data could be explained by embarrassment. The awkwardness of others was particularly apparent after a violent death, and it may be that the public feel even more socially inadequate when responding to someone bereaved traumatically than someone bereaved by other causes. Part of this social incompetence may involve a lack of awareness of the bereaved person's distress. The perception that others are avoiding them would also serve to heighten a bereaved person's self-perceived stigma. Further insights into the role of social incompetence in apparently stigmatising attitudes are to be gained from qualitative work with non-bereaved people, to describe the attitudes that underlie their behaviour.

5.4.7.2.2 Mental illness

Due to carer strain (70), assortative mating (60) or assortative relating (61) it is possible that people bereaved by suicide have higher rates of mental illness than other bereaved groups, both preceding and post-dating the bereavement. This could be an explanation for others shunning them or being perceived to avoid them. Although in this sample there were no differences between those bereaved by suicide and the other two groups in relation to incident depression or possible personality abnormalities, the suicide-bereaved group had a clear excess of pre-loss depression, pre-loss suicidality, and current distress. Stigmatising attitudes from others regarding mental illness or suicidality may have preceded the death and become more apparent to the bereaved after their loss. It is also possible that those who felt deep shame in relation to a suicide were more likely to perceive others' avoidance as stigmatisation due to the suicidal nature of the death rather than avoidance due to the death *per se*.

5.4.7.3 Subjective and objective stigma in relation to support

Earlier in this chapter I mentioned the potential association between stigma and lack of support (see 5.2.4.2). Both self-perceived stigma and objective stigma are likely to

play a role in this. Many reviews have suggested that the stigma associated with suicide bereavement may limit social support offered and reduce motivation to seek help (13;67;81;130;292). Self-stigma is certainly an important factor in dissuading people from seeking help for mental health problems, primarily due to reluctance to disclose a mental health condition (46).

A feedback loop between social and psychological dimensions has been suggested following a violent loss (88), which I develop further here. After the bereavement a bereaved person may perceive their own caregiving to have been inadequate, engendering a sense of being unworthy of support, with consequent self-isolation. If friends and family perceive the provision of support to be unwelcome or find it emotionally exhausting, less support may be offered. If the bereaved person perceives a diminishment of support, this reinforces their sense of being unworthy of help, resulting in further self-isolation. Overt avoidance by others also diminishes support available, and may send out a message to others that avoidance is acceptable. Other factors are likely to be involved, including a sense of stigma compounding a sense of being unworthy, the personality style of caregivers, pre-existing family dynamics, and the bereaved person's perception that the support is unhelpful. If psychopathology develops, either because of, or in spite of reduced help, others' tendency to avoid the bereaved person might increase further.

The above framework suggests that even if standardised instruments existed and indicated that those bereaved by suicide receive a similar level of support to those bereaved by other causes, they may be less aware of it, feel less worthy of it, or value its content less than other bereaved groups. It also illustrates the problems inherent in designing standardised measures of help received, help offered, and the helpfulness of support, to use in the investigation of the association with stigma.

5.4.8 Similarities between bereavement by suicide and by unnatural causes

This study found no differences in post-bereavement suicidal ideation, suicide attempt, non-suicidal self-harm, incident depression, or drop-out from work or education in the two groups bereaved by violent deaths. These findings accord with those of 21 studies identified in my systematic review (102), which found no differences between people bereaved by suicide and those bereaved by sudden

violent deaths on several standardised measures of grief intensity, stress reactions, and psychopathology (58;88;205;209-212;214;215;217;219) (216;218;221;223;229-234). It also accords with the findings of a study published subsequently (348), showing no differences in psychopathology between people bereaved by suicide and by accidental deaths in China. Together these findings are striking given that suicide prevention strategies tend to focus only on the suicide-bereaved rather than including those bereaved by other violent deaths. With further work adding to the evidence base for adverse outcomes in those bereaved by violent means (349), the needs of those bereaved by non-suicide unnatural causes should also garner policy attention.

Explanations for the similarities in outcomes between the groups may lie in lack of support: groups bereaved by violent causes of death reported greater stigma, shame and rejection than those bereaved by natural causes of death, and this may affect their willingness to seek help or indeed the willingness of others to offer help. Another explanation is similar experiences of carer burden. Those who die by suicide and other violent causes appear to share many self-destructive characteristics (350), and both are associated with adolescent emotional instability and conduct problems, albeit to a lesser degree for accidental death (350). There may be considerable caregiver strain preceding bereavement by unnatural causes in relation to the deceased's medical problems, substance abuse, criminal behaviour, depression, or psychiatric treatment. US qualitative research has documented the relief from the burden of living with difficult family dynamics and mental illness that some carers experience following a suicide (68;69), and similar research is needed among families bereaved by accidental deaths. The only previous systematic review of studies measuring the impact of suicide bereavement was inconclusive regarding differences between bereavement by suicide and that by other causes on measures of relief and acceptance (66). The suicide-accident dichotomy may be over-simplistic, masking some important differences between different suicide deaths and between different accidental deaths (308).

A third and related explanation is the varying degree of expectedness of a death. Previous research in the UK shows that in the first year after the death of a partner the mortality risk is higher if the death was unexpected (defined as a case in which the partner died without recorded chronic disease) than if it was expected (due to a

diagnosis of chronic disease) (34). Although most suicides are sudden, their level of unexpectedness is likely to vary according to the level of psychiatric morbidity and knowledge of behavioural cues to suicide (for example warnings or threats of suicide, and attempts). This expectedness may attenuate some of the shock associated with sudden traumatic deaths (129). Indeed chronic stress pre-dating the suicide might also be ameliorated by the occurrence of the feared event (129). Caregivers of suicidal people describe many years of being on 'suicide-watch', with 79% of the suicide decedents in one US sample having given clear signs of intent to family members by means of expressing suicidal thoughts or plans, or by previous attempts (68;69). Almost half of suicide-bereaved parents in a Swedish sample had worried about their child's suicide risk during the year before their death (70). However UK qualitative research on close contacts bereaved by suicide has highlighted that some describe a lack of clear distress signals prior to death, and a sense that warning signals and communications of distress were difficult to interpret (351).

It would be informative to conduct qualitative research with people bereaved by accidental deaths to determine the extent to which they had worried about risk-taking behaviour and anticipated tragic outcomes. The first systematic review describing the impact of suicide bereavement, published in 2008, was inconclusive regarding differences between bereavement by suicide and that by other causes on measures of shock (66). This included a US study finding that next-of-kin bereaved by suicide were less shocked at the death than those bereaved by accident (68). It may be that there are sub-groups within those bereaved by suicide and those bereaved by accidental deaths, defined by the degree to which they expected the death. Any of those expecting the death will have had an opportunity for anticipatory mourning (106), and perhaps better outcomes than those for whom the death was not anticipated. However difficulties in measuring dimensions such as expectedness make it hard to test these theories.

5.4.9 Evidence for worse outcomes in those bereaved by unnatural causes compared with suicide

Some studies have shown worse outcomes on measures of emotional distress (68) and depression (71;101) in people bereaved by unnatural causes compared with suicide bereavement. One such study (published as a book and not as a peer-

reviewed paper) had been identified in the previous systematic review published in 2008 (66), in which worse depressive outcomes were reported in family members bereaved by accidental death compared with suicide. A recent peer-reviewed Canadian study, identified in my own systematic review (102), found a significantly increased risk of depression in parents bereaved by their child's death in a motor vehicle crash compared with parents bereaved by their child's suicide (71). Its authors suggested that the mental health of offspring dying by suicide may have been deteriorating for some time and that not all these suicides had been unexpected (352). Indeed differences in depression risk may have arisen because the suicide deaths were more anticipated than the accidental deaths, allowing the grief process to start earlier, and perhaps resolve earlier.

5.5 Strengths of the study

Compared with the studies identified in my systematic review (102) and published subsequently (348), this is the largest-scale study conducted in any country to date comparing the impact of suicide bereavement with other types of bereavement. Although not all the surveys I identified had reported their denominator, my study also appears to have the largest sampling frame, with the survey having been sent to 659,572 people. Other studies using national registries have achieved larger sample sizes, but these data do not include any measures of the closeness of the relationship to the deceased, nor of outcomes such as suicidal ideation, social functioning, or suicide attempts not receiving medical attention (59;60;71;100;101). Whilst use of routine data has permitted registry-based studies to investigate completed suicide as an outcome (59;60;100), their measures of depression rely on physician-generated diagnoses (71) or psychiatric admission (101) rather than measuring self-reported prevalence of depression (using CIDI screening) or suicidality (using APMS measures), as in this study.

Although a response could not be calculated accurately, the proportion of those contacted who responded to this survey was consistent with my calculation of the numbers eligible (based on an estimate of the denominator of those bereaved by suicide) and a 10-20% response. Indeed the n=5,085 people responding to the questionnaire, of whom 91% consented to participate, seems high for what was an

impersonal means of contacting them about a highly sensitive matter. Moreover, the proportions of those volunteering for a follow-up study (32%; n=1,502/4,630 consenting to participate), volunteering for a face-to-face interview (30%; n=1,408/4,630), and requesting a copy of the final report (42%; n=1,959/4,630) greatly exceeded those expected, particularly given that the invitations were located at the end of the questionnaire. Feedback contained in the qualitative responses indicated that many had found it a helpful experience, and were glad to contribute to improving the understanding of sudden bereavement and provision of support. This is in keeping with other studies of bereaved individuals approached after research participation, who reported that taking part had had a therapeutic effect (341;343).

My survey methods and analysis were designed specifically to overcome many of the methodological limitations of previous studies measuring the effect of suicide bereavement. The majority of these have been exploratory analyses, with no power calculation or adjustment for pre-bereavement clinical covariates, increasing their chances of type I error (102). I reduced the risk of type I error (detecting a difference where none exists) by using: a hypothesis-based approach; a sample size calculation focussed on two primary outcomes; standardised measures (for 8 out of 10 outcomes); efforts to control for pre-bereavement functioning; restricting analyses to 2 primary outcomes and 8 secondary outcomes; and using a more stringent significance threshold for secondary outcomes. In particular by restricting many outcomes to those that post-dated the bereavement (suicidal ideation and attempts, non-suicidal self-harm, drop-out from work or education, incident depression) the temporal sequence of exposure and outcomes was clearer.

Many previous studies have also had small sample sizes, increasing the chances of type II error. By using a large community sample I was able to achieve sufficient statistical power and minimise the biases inherent in using a help-seeking sample. This means that any positive findings are unlikely to be false positives, which might cause unnecessary worry or psychiatric treatment (in relation to any excess risk of suicide attempt). Similarly, any negative findings are unlikely to be false negatives, which might cause undue complacence.

The large sample size and the high proportion of respondents completing the 20 qualitative questions at the end of the online survey, has resulted in the creation of a rich qualitative database. This comprises the responses of n=2,755 people, of whom n=495 were bereaved by suicide. In addition to this I have the transcribed data from 27 interviews with a purposive maximum variation sample of those in all three bereavement groups. Together these qualitative data will be invaluable in developing a theoretical framework to explain the adverse outcomes identified in this study, and for answering a number of additional research questions. These are listed below (see 5.8.2.1). Indeed these qualitative data may even be more valuable than the quantitative data in providing deeper insights into the day-to-day difficulties that characterise those who experience sudden violent bereavements, which may explain their risk of suicidality.

5.6 Limitations of the study:

Earlier in this chapter I discussed the possibility that the study design might have introduced the possibility of type II error, residual confounding, selection bias, non-response bias, contamination, reporting bias, recall bias, and reverse causation. That discussion considered whether such factors might provide alternative explanations for my findings. I cover some other limitations of the study below, ending with a consideration of the overall impact of these limitations.

5.6.1 Response

Lack of information on the response to the study might be a considered a limitation, but not all studies are able to gauge an accurate response rate. My estimates of the number of those exposed were based on best available evidence, and I powered the study on the smallest exposure group.

5.6.2 Use of measures developed for this study

Only one of the 10 outcome measures used was developed for this study; namely drop-out from work or education. There are consequently no population baseline data for this measure, and no information on reliability or validity. The justification for including this measure was to increase the relevance of the study's findings to student counselling services, HEI human resources departments, primary care, and

bereavement counselling services. The finding that young adults bereaved by suicide are at increased risk of dropping out of a course or a job, with this risk explained by stigma, suggests a need for further research in this field, and the development of a validated measure of occupational functioning. Pending further confirmatory findings, these results indicate the need for greater attention to the educational and occupational support provided to young people bereaved by suicide, in order for them to realise their potential.

Two of the covariates used in the final model were also developed for this study; that eliciting a family history of suicide and that measuring kinship. This latter variable was weakly collinear with a measure of closeness, also developed for this study. No published studies in this field have used a validated measure of closeness, but have tended to rely on subjective perceptions (309) or the distinction between first-degree relatives (spouses, parents, children, siblings) and others (353). Where other studies have used standardised measures of family history, these have been shown to be subject to reporting bias, with subjects more likely to disclose a family history of suicide if they are female, younger in age, or have a psychiatric disorder (354). I did not collect sufficiently detailed information to be able to adjust for strength of family history of suicide, for example by using a Reed's score or equivalent to take into account the number of affected relatives as a proportion of the family (355). This was a trade-off with questionnaire length, to balance the risk of drop-out, but would be an important variable to consider in future such research.

5.6.3 Exclusion of childhood bereavements

One of the exclusion criteria for this study was the index bereavement having occurred before the age of 10, on the basis that we were interested in the impact of sudden bereavement on those with adult levels of cognition and also wished to reduce recall bias of events in childhood. As young and middle-aged men are those at highest risk of suicide (12;110), an age at which some may have young children or siblings, suicide bereavement would appear to be an important issue in early childhood. The same applies to childhood bereavement by other violent causes, as risk of accidental death also peaks in young men (145;161). Inclusion of childhood bereavements would have allowed quantitative and qualitative exploration of how the experience of early sudden bereavement might differ from that in adolescence or

early adulthood. As discussed in my systematic review (102), which included studies of bereaved children suddenly, critical issues for children losing a parent unexpectedly include the task of mourning, a change in quality of the surviving partner's parenting (225), and the fear of further abandonment (208). Analysis of qualitative data on childhood bereavement would have provided insights into the interventions judged by this group to be most appropriate for addressing these issues.

5.6.4 Unmeasured variables

For reasons of sensitivity, questionnaire length, and lack of standardised measures, I did not collect data on a number of potentially relevant covariates:

- homosexuality, which is a risk factor for suicide (356) and suicide attempt (357)
- childhood sexual abuse (CSA), which is associated with suicidality (358)
- overseas status or country of usual residence
- the full range of protected characteristics defined by equality legislation
- history of (or exposure to) suicide attempt in family members, which may be a risk factor for suicidality (247;359-361).
- non-fatal suicidal behaviour in friends, which may also be an important risk factor (330) (238;362;363), perhaps through a process of social modelling
- exposure to irresponsible reporting of suicide in the media, given media portrayals of suicide can have imitative effects on suicidal behaviour and completed suicide (94;329) particularly in young people (94)
- whether the relationship with the deceased was secret or hidden (for example, a clandestine partner or child)
- a measure of the expectedness of the death
- a breakdown of the frequency of contact in the year prior to death by each possible mode of communication, to include face-to-face (individual or group) contact, telephone contact, email, text message, Facebook and other social networks, Skype and other video conferencing programmes, Twitter, and instant messaging

- lifetime bereavement exposure (total lifetime bereavements by any mortality cause, by kinship, closeness and age at bereavement), to establish a measure of bereavement dose, which would be likely to be correlated with age
- an objective measure of the quantity of help offered or received, given that any reduction in support (234) may have explained any risks of adverse psychosocial outcomes
- a subjective measure of the quality of the help offered or received, and the time course for any help offered or received, as well as any preferences for when help should have been (re-)offered (i.e. a measure of when the bereaved person would have been ready to receive help)
- physical health, including exacerbations of pre-existing conditions (109)
- an objective measure of healthcare utilisation, although this has been shown to have no impact on the long-term course of bereavement (164).

I had considered adding the outcome of complicated grief (353;364), but bereavement-related depression was not an established diagnosis at the time of the study design (42), and a decision was made to limit the number of outcomes in order to reduce the risk of type I error. I therefore included only 1 item from the Inventory of Complicated Grief (43), to explore its relationship to other clinical variables. More recently, Dutch evidence has supported a mutual association between suicidal ideation, depression and complicated grief after suicide bereavement (164), suggesting that complicated grief would be an important variable to measure.

An additional rationale for omitting the measures listed above was the importance of keeping the questionnaire as brief and relevant as possible, to reduce participant fatigue and the consequent risk of drop-out and missing data.

5.6.5 Heterogeneity of follow-up periods

Respondents in this analysis had been exposed to bereavement for between 1 day and 30 years. The cultural notion of time healing is backed up by specific bereavement studies that provide evidence for a time decay effect on adverse outcomes following bereavement (30;164;310;342). However improvements cannot be assumed to be linear over time, and long-term follow-up may miss fluctuations over the intervening

period. Bereavement theory has moved away from the idea of the grief process as a series of distinct stages (365), towards one in which a bereaved person addresses a series of tasks, but not necessarily in a specific order (20). Some stages may overlap, are reversed or skipped (91). Some individuals cycle between the pining and despair stages repeatedly, before reaching the phase of reorganisation (366). The idea that reactions to a loss fluctuate over time retains currency, and has a clinical basis in relation to anniversary reactions. It is possible that the acute effects of bereavement differ substantially from longer-term effects, and the implications of loss in adolescence (or indeed childhood, which was not measured in this study) may differ to those in adulthood. The heterogeneity in years elapsed in this sample, and therefore in bereavement experiences, would increase the chances of type II error in this study.

This heterogeneity was accounted for to some extent in the analysis, by including time since loss as a continuous measure in the fully-adjusted model. Those bereaved by natural causes were significantly more likely to have been bereaved more recently than the other groups. This reduced the time period within which primary outcomes (suicidal thoughts and attempts) might have accrued for this group; assuming a positive correlation between time and cumulative adverse outcomes. However, it is also possible that non-response bias had operated in relation to time elapsed. This would mean that those with more remote bereavements may have been more likely to participate if they were still grieving intensely, and those less affected by the death (at any time point) may have been less likely to respond if the study no longer appeared salient to them. This would tend to over-estimate the effect of remote bereavements.

My adjustment approach allowed me to observe the effect of time (shown by Model 7, which adjusted for socio-demographic factors and time since bereavement) compared with that of other covariates (Models 2-6). In relation to primary outcomes (accrual of post-loss suicidality), time negatively confounded the unadjusted risk by a magnitude of 0.3-0.4 or had no effect. In relation to secondary clinical and functional outcomes (accrual of post-loss depression, drop-out, or NSSH) time negatively confounded the unadjusted risk by a magnitude of 0.1-0.5 or had no effect. For only one clinical outcome did time behave as a positive confounder - risk

of post-loss depression relative to those bereaved by sudden natural causes - and this was by a magnitude of 0.3. In relation to current social functioning time either negatively confounded the unadjusted risk by a magnitude of only 0.2 or had no effect. In relation to GEQ outcomes describing current stigma, shame, responsibility and guilt, time behaved as a negative confounder to a magnitude of only 0.1-0.2 or had no effect.

Interpretations of the above predominantly negative confounding effect of time are that when allowance is made for the shorter person-years at risk for those bereaved by natural causes, an under-estimate of the risk of adverse outcomes in those bereaved by suicide is revealed. A more powerful test was that of a sensitivity analysis to exclude time from the final model (results not reported here), which indicated that my findings were unchanged whether or not time was included. It would be interesting to conduct a *post hoc* analysis stratifying the sample into recent and remote bereavements (at a cut-off of 2 years since the bereavement), to test for an interaction with time. If the null hypothesis was supported, risk of any adverse outcomes in those bereaved by suicide or by sudden unnatural causes would be similar whether bereavement was recent or remote. However, to further investigate what is perhaps a complex temporal component of different bereavement reactions, registry-based cohort studies would be the optimal approach.

5.6.6 Impact of missing data

Based on the assumption that the majority of missing data in this dataset were MNAR, it was likely that the sub-sample analysed (of cases with complete data for all covariates in the analysis) differed from the full sample on key characteristics. Data MNAR will have introduced bias and reduced precision in my estimates, and it is possible that respondents with the worst outcomes omitted to provide data on these variables, resulting in under-estimations of the risk. However the use of an anonymised online survey is likely to have resulted in fewer missing values for sensitive questions than for a face-to-face interview. Also, imputation of missing values using worst and best case analysis indicated that findings were unchanged.

The ordering of questions in the survey, such that outcome measurement was downstream of socio-demographic characteristics but upstream of clinical

characteristics, meant that differences between completers (those who provided at least one outcome) and non-completers could only be analysed in relation to socio-demographic characteristics. This demonstrated a bias towards respondents who were white, female, educated to a higher level, of a higher social class, and with less sickness absence. Nevertheless it remains possible that completers had lower distress and were less likely to have had a psychiatric history. Indeed poor social functioning predicted missing data on the subsequent primary outcomes. Given that those bereaved by suicide were significantly more likely than people bereaved by sudden unnatural causes to have poor social functioning, it is possible that those bereaved by suicide were more likely to drop out mid-survey. If the people bereaved by suicide and in most psychological distress were more likely to drop out, this would tend to under-estimate the risks of any adverse outcomes specific to this exposure. However this possibility is balanced by the lack of any association between mode of bereavement and number of outcome measures completed, and also by the finding of no difference is social functioning between those bereaved by suicide and those bereaved by sudden natural causes. These suggest that differential drop-out by those bereaved by suicide was unlikely, perhaps due to topic salience.

My use of listwise deletion will also have reduced the statistical power, although the smallest exposure group in the eligible sample (n= 614 for suicide) exceeded the minimum of n=466 required in my power calculation for adequate power. When excluding all those respondents who were missing data on any of the covariates used in the analysis (10.6% of sample), and those missing data for any outcome used in the analysis, group size was never reduced below n=551, suggesting that the analysis was adequately powered (see Table 4-1: Extent of missing data on key variables by exposure group). This would reduce the possibility of type II error.

5.6.7 Statistical methods

5.6.7.1 Cluster size

The considerable variability in cluster size may have affected the precision of the risk estimate, and the presence of clustering itself may have resulted in the calculation of standard errors that are over-precise. However, using a random effects model the effect of clustering was shown to be minimal for the primary outcomes suicidal ideation (0.8%) and suicide attempt (4.7%). This justified the inclusion of a cluster

variable whilst also indicating that clustering was not marked. My main findings were also robust to sensitivity analysis dropping all those HEIs in which the number of respondents was below the median value.

5.6.7.2 Putative explanatory variable

I tested an *a priori* hypothesis that stigma explained any associations between suicide bereavement and adverse outcomes, which was supported. Given the use of listwise deletion in the context of 1.3% missing data for the variable stigma, risk estimates derived from adding stigma to the final model for each non-GEQ outcome involved a very slightly reduced sample compared with those used in the main analysis of each outcome. As discussed previously (see 5.2.4.2) it is also possible that stigma may be a marker for another variable, such as lack of support, explaining the relationship between exposure and adverse outcomes.

5.6.8 Overall impact of bias, chance, confounding, and other study limitations

Overall the most important limitations of this study are the potential for selection bias (in relation to socio-economic variables and those who had died by suicide), non-response bias (in relation to both socio-economic status and gender), recall bias, and reverse causation. The latter three would be present even in a random sample, and the potential for selection bias was the penalty for allowing access to a hard-to-reach population. Given the likely role of selection and non-response bias, the results of this survey could be said to be more generalisable to young bereaved women than men, and to young people studying and working in HEIs than those in other settings. Nevertheless, with the exception of registry-based studies (which are unable to consider self-reported outcomes such as social functioning or suicide attempt), my systematic review demonstrates that this is the largest study of its kind internationally in relation to this topic (102). Whilst recognising the limits of generalisability, it still represents the best quantitative evidence available to date in relation to suicide-related outcomes and other self-reported measures among young people in the UK who have experienced sudden bereavement. Given the possibility of recall bias and of reverse causation, the study indicates the need for confirmatory research using routine longitudinal data to test specific hypotheses about the temporal relationship between sudden bereavement and suicide-related outcomes.

5.7 Implications

5.7.1 Clinical implications

My findings represent a significant contribution to clinical knowledge. At a population level, they have a direct bearing on the content of the clinical risk assessment. Clinicians normally inquire about a family history of suicide in a patient being assessed for mental health difficulties. My data analysis and systematic review show that clinicians should expand on this to inquire about a history of suicide in a partner or peer, and indeed in any close contact, as well as a history of any other sudden or traumatic bereavements. Clinically both suicide bereavement and bereavement by non-suicide violent death should be considered as relevant in a risk assessment for suicidal behaviour or mental illness.

Assessment of subjective stigma is also likely to be a useful adjunct to the risk assessment. My analysis identified high levels of self-reported stigma to characterise those bereaved by suicide, and this stigma seemed to explain the excess risk of adverse psychosocial outcomes. This suggests that the clinical interview should use screening questions derived from the GEQ stigma sub-scale to identify high levels of subjective stigma. This might identify those at highest risk of adverse outcomes, and could also be a useful marker for lack of support. Therapeutic components of the clinical interview might also address any perceived stigma, through communicating a lack of aversion to the patient and guidance as to the support available. The risk information could be used to design a management plan that bolstered available support, drawing on healthcare services and the voluntary sector rather than relying unrealistically or inappropriately on informal support.

These suggested additions to the psychosocial assessment have relevance to the emergency services, primary care staff, and emergency department clinicians, who should include these screening questions in any risk assessment for a patient presenting following self-harm or with suicidal ideation. It has particular relevance within mental health services, where the higher baseline risk of suicide in psychiatric populations means that mental health professionals frequently encounter friends or relatives bereaved by a patient's suicide. Without specifically probing for a history of violent bereavement they may be unaware that their patient carries a risk factor for

suicide attempt in addition to that associated with their mental illness. The protocol for suicide audit (367) might also signpost appropriate self-referral pathways for all close contacts of the deceased, including appropriate interventions for staff.

At an individual level the findings of this study are of clinical interest to anyone who has contact with young traumatically bereaved relatives and non-relatives, in alerting them to the risks associated with violent bereavement. This includes police, NHS clinicians (within Emergency Departments, Coronary Care Units, Intensive Care Units, in-patient wards, general practices, and community teams), social workers, teachers, youth workers, employers, faith leaders, counsellors, and coroners' officers, as well as the general public. As part of my dissemination plan each HEI will receive a copy of the final report on quantitative findings together with a report on anonymised findings specific to their institution to allow a comparison with national data. This will be of particular interest to Student Support and Human Resources departments. The report will highlight the particular risks characterising young adults (students and staff) bereaved by violent causes and the need for the development and evaluation of interventions to address these risks.

Primary care staff, bereavement services and student and occupational counselling services will be particularly interested in finding out what can be done to address these adverse outcomes. The qualitative findings of this study will contribute to a clinical understanding of the interventions likely to be beneficial to those who are violently bereaved. This knowledge will help guide the development of interventions to reduce the adverse outcomes identified, which will require cost-effectiveness analysis, and the development of evidence-based guidelines. Such interventions are likely to include those that address the stigma of violent bereavement, given that high levels of stigma characterised those groups and appear to explain the excess risk of psychopathology.

5.7.2 Policy implications

5.7.2.1 Quantification of risk

The results of this study have direct relevance to the 2012 suicide prevention strategy for England (110), in that it provides evidence to support its inclusion of people

bereaved by suicide as a vulnerable group. However, the results also suggest that revisions of this strategy should include people bereaved by unnatural deaths, on the basis that they share a similar risk of suicidality. The strategy should therefore apply to all those bereaved by deaths classified by a coroner as suicide, accident or misadventure, lawful or unlawful killing, an open verdict, and some narrative verdicts, on the basis that they would be at a theoretical increased risk of suicide attempt.

Area for Action 4 of the strategy (*Provide better information and support to those bereaved by suicide or affected by suicide*) should perhaps go further by identifying the high levels of stigma reported by these groups, and its potential role in explaining difficulties with social and occupational functioning and suicidal behaviour. It could suggest, although there are no evidence-based interventions to recommend, that support should be targeted at those who feel most stigmatised, particularly as this may be a marker for lack of support *per se*.

This study found that identified risks were similar in relatives and non-relatives, but did not specify risk by kinship group. In my discussion of non-response bias, I mentioned that young men may have the greatest exposure to violent bereavement, mainly due to the additive effect of male peer suicide and paternal suicide. This suggests that targeted interventional work should focus on young men bereaved by the violent death of a father or male peer.

Given that both groups are suggested as vulnerable to suicidality it would be important to re-estimate the burden of the problem in terms of the annual incidence of sudden violent bereavement. In the UK in 2007 numbers of violent deaths were recorded as follows: 2,968 deaths due to transport incidents, 1,207 by accidental poisoning, and 369 due to assault (368), with 5,706 due to suicide (369). Extrapolating the evidence-based multiple of 60 people affected by each suicide death (18) would suggest an annual incidence of at least 272,640 bereaved by violent non-suicide causes and 342,340 bereaved by suicide annually. More recent figures for England and Wales in 2012 show that 1,574 people of all ages died in motor vehicle crashes (370) whilst 4,841 suicides were recorded among people aged 15 and

over (371), giving an estimate of at least 384,900 people bereaved by a narrower definition of violent causes in England and Wales that year.

The WHO estimates that internationally each year 800,000 people die by suicide (19) and 1.3 million due to violence (372). This would suggest an annual incidence of 2.1 million people bereaved by violent causes worldwide. My systematic review found one study that had found a similar risk of suicidality in these two groups (71), and a number of studies finding no differences between them on measures of grief, stress, and psychopathology (102). This means that every year 2.1 million people develop a risk factor for suicide attempt and mental illness, suggesting that addressing the impact of sudden violent bereavement should feature more prominently in international public health discourse.

5.7.2.2 Need for interventions

Given the adverse outcomes associated with sudden bereavement, as demonstrated both in this study and in the studies identified in my systematic review (102), there appears to be a need to provide evidence-based support to people who suffer a traumatic bereavement, particularly partners and mothers bereaved by suicide. The results of this study suggest that in the UK there would potentially be considerable policy impact in relation to reduction in suicide attempts if effective interventions for people bereaved violently could be identified and implemented. In my Results section (see 4.2.10) I made a crude estimate of 53 excess cases having made a suicide attempt among those bereaved by suicide compared with the non-bereaved population. This was based on comparison of the population prevalence of lifetime suicidal ideation and attempt, as derived from the 2007 APMS data (275), with those from the bereavement exposure groups in my study (see Table 4-5: Comparison of main outcomes by bereavement exposure). Comparison of those bereaved by suicide with those bereaved by sudden natural deaths suggested an excess of 25 excess cases of suicide attempt in the former. The suicide, and indeed suicide attempt, of a young adult carries substantial direct, indirect and societal costs (145). These include the healthcare costs of medical treatment and psychiatric follow-up, the distress caused to relatives and friends, loss of productivity in relation to work or caring responsibilities, and any disruption caused to transport staff, police officers, and bystanders. As my study measured non-fatal outcomes it was not possible to estimate

the crude excess of cases of fatal suicide attempt, for which the costs would be greater.

Any intervention shown to reduce the risk of non-fatal suicide attempt, and indeed of fatal suicide attempt, in bereaved people would have great personal benefits to the bereaved as well as wider societal benefits. Unfortunately the evidence base for interventions targeted at those bereaved by suicide is very limited (119), as it is indeed for bereavement *per se* (20). However, studies such as this one may ignite interest in the development and evaluation of novel interventions, both for people bereaved by suicide and by other violent deaths. Such interventions might operate at an individual level (taking a postvention approach) or at a population level (to address public attitudes towards violent bereavement). These are described below.

5.7.2.2.1 Individual-level approaches

Usually the identification of a risk factor for an adverse outcome would indicate a need to screen such risk groups and offer clinically-based interventions. Indeed the suicide prevention strategy for England suggests that GPs should be vigilant to the vulnerability of family members after a suicide (110), implying that screening would be helpful. However there are numerous structural barriers to this. First is a demand-side barrier, in that a first analysis of my qualitative data indicates a preference for lay support, further testified by voluntary organisations (251;252). Although this contrasts with the findings of Scandinavian and US-based studies showing demand for (but poor uptake of) professional help (120), local cultural factors are likely to be important influences on demand. If lay care and the expertise of voluntary sector organisations (225) are preferred to interventions delivered through statutory services, it may not be appropriate for GPs to act as gatekeepers.

Secondly, there is a lack of an infrastructure for screening, and no guarantee that the deceased will be registered with the same general practice as their partner, relative or other close contact. There is thus no obvious means of inviting the bereaved for a screening appointment beyond a centrally-coordinated and impersonal invitation that may not be acceptable to recipients. Thirdly, the quality and outcomes framework (QOF) in the UK contains no incentives to conduct bereavement visits and indeed may prove as a disincentive to such care (373). Research experiences show that

Dutch GPs seemed reluctant to broach the topic of suicide with a bereaved family, or to suggest participation in a trial (137). Short appointment slots also give less scope to explore sensitive issues in relation to violent losses.

Alternative screening interventions include local screening models such as the Barnet Bereavement Service; a pilot project funded from 2006-2008, and staffed by a consultant psychiatrist. A visit was offered to the family members and/or carers of all deceased persons in the London borough of Barnet recorded by the coroner as a suicide or open verdict, 2-8 months after the death. The service was not evaluated nor continued, but feedback from the service's clinician indicated that those agreeing to a visit appeared to find this acceptable (374). While overcoming the problem of a deceased's relatives not being registered with the same practice, it only reached those registered with the coroner as kin, and therefore neglected peripheral members of the social network.

An alternative to screening, which overcomes the problem of focussing exclusively on next-of-kin, is to emphasise the importance of self-referral. Given that this study found risks of adverse outcomes in the suicide-bereaved to be similar in relatives and non-relatives, the need for care appears to be equal. By providing care for any close contact bereaved violently, those who might otherwise deem themselves ineligible for support might be encouraged to seek help. This would be particularly relevant for the hidden bereaved (1), who are outside the deceased's immediate social circle and would not otherwise be picked up by screening. Most of the voluntary organisations providing bereavement care that are listed in the suicide prevention strategy (110) and its allied guidance (138) accept self-referrals. Factors such as stigma and a sense of not being worthy of help, which may be intricately related to closeness or kinship, are likely to dissuade bereaved individuals from self-referring. Marketing of such services should attempt to address these issues. The barriers described in this section indicate the need to design cost-effectiveness evaluations of interventions delivered in the voluntary sector, accompanied by evaluations of their acceptability to bereaved people.

Finally, and perhaps most powerfully, screening is only appropriate if evidence-based interventions exist, and these are very limited, either in relation to bereavement

per se (20) or specifically suicide bereavement (119). The only Cochrane review of bereavement interventions focusses on parental support after perinatal death (375), although a review of interventions for bereaved children is currently in process. This may in part be due to the relatively few interventions available to people bereaved by suicide or other violent causes. Group therapy for people bereaved by suicide, delivered by Cruse Bereavement Care in collaboration with Samaritans, has been piloted recently in London. This is now being rolled out more widely, with plans for an evaluation in 2015, and with the potential to adapt the intervention for those bereaved by other violent causes. Other interventions, also not evaluated, include input from police family liaison officers and coroners' officers; professionals who often have contact with the bereaved (1;376) and are in a position to respond to distress. My findings in relation to stigma and shame suggest that they may be a need to adapt cognitive behaviour therapy (CBT) for individuals reporting high levels of stigma in relation to a traumatic loss. Such a model of CBT targeting high levels of subjective stigma or shame might also have applicability to young and middle-aged men perceiving stigma or experiencing shame after any loss or failure, including that of a job, a relationship, or custody of children.

5.7.2.2.2 Population-level approaches

My qualitative preliminary study and quantitative findings emphasised the stigma associated with suicide and other violent deaths, suggesting that anti-stigma interventions might improve the quality of informal support for young suicide-bereaved people. Such interventions might use educational approaches to change attitudes and behaviour towards those bereaved violently, but without normalising the idea of suicide, particularly given the risks associated with romanticisation (94). Below I refer to the need for further work with non-bereaved individuals to understand their attitudes to people bereaved by different causes (see 5.8.2.2). By understanding why society has such discomfort with people bereaved violently it might be possible to address negative attitudes and social incompetence, and reduce the distress to those who feel the ill effects of being stigmatised or avoided. Indeed given the strength of the evidence favouring population-based over individual-level approaches (5), this might be a more cost-effective use of suicide prevention resources.

5.7.2.3 Dissemination strategy

To encourage the development of individual-level and population-level interventions it will be important for the results of this study to be disseminated not only via publication in academic journals, but also using reports circulated to voluntary sector organisations. Finally it will be important to communicate my findings to the lay public, using the appropriate media channels, to raise awareness of the particular vulnerabilities of people bereaved traumatically, including their perceptions of stigmatising attitudes. This has the potential to modify the behaviour of non-bereaved people towards them, as outlined further below (see 5.8.3) under Interventional studies. However public communication will need to be handled sensitively, to avoid being seen to suggest that suicide attempt after a violent bereavement is a self-fulfilling prophecy. Instead the emphasis should be on what interventions can be identified to assist the grieving person cope more constructively with stigmatising behaviour and difficulties in day-to-day functioning.

5.8 Future research

5.8.1 Quantitative research:

5.8.1.1 Further analysis of bereavement study dataset

5.8.1.1.1 Help-seeking behaviour

I am yet to analyse data collected from this sample on respondents' help-seeking behaviour, both after sudden bereavement and after an episode of suicidal or non-suicidal self-harm post-dating the bereavement. These variables describe the type of help received after each such episode, and how long it was after the death that they received help perceived to be valuable. As choices can be collapsed into formal and informal sources of help it will be particularly interesting to explore the socio-demographic characteristics predicting avoidance of the formal and/or informal sector. The 2012 suicide prevention strategy for England (110) places great emphasis on provision of support for people bereaved by suicide. Area for Action 4 implies that the main channels for this support are the voluntary sector (138), specialist bereavement counselling and support, and primary care vigilance. The overview provided by a first coding of the 27 qualitative interviews (see 5.8.2.1 below) indicates that in relation to help-seeking preferences friends and family are preferred to the voluntary sector or healthcare services. If this is replicated in the quantitative

data this will be evidence to support a revision of the strategy's recommendations regarding the most appropriate sources of support and vigilance. It will also suggest where the focus of cost-effectiveness studies should lie.

5.8.1.1.2 Re-analysis

I also plan *post hoc* analyses of my quantitative data to test a number of specific hypotheses. All such studies would have clinical utility in terms of identifying further specific screening questions to add to risk assessment for those who have experienced sudden bereavement. The hypotheses are that:

- level of social support predicts help-seeking after sudden bereavement
- risk of adverse outcomes vary by closeness to the deceased (stratifying at a cut-off of very close *versus* quite close), such that risk of suicide-related outcomes are higher in those who are less close (due to lack of bereavement support)
- there is no interaction with time since bereavement (stratifying at a cut-off of 2 years since the bereavement), such that risk of any adverse outcomes in those bereaved by suicide or by sudden unnatural causes would be similar whether bereavement was recent or remote
- cohort or period effects operate in relation to the greater cultural acceptability of expressing suicidal ideas among young adults (stratifying at a bereavement age cut-off of 18), such that risk of suicidal ideation is higher in younger people.
- dose of exposure to bereavement, defined as number of exposures to different modes of bereavement (see Figure 4-4: Venn diagram showing the combinations of exposures in eligible sample), moderates outcomes

As I have data on degree of relatedness, both in relation to kinship to the deceased and to each family member who had died by suicide, it may be possible to explore whether degree of relatedness has an additive effect to dose of bereavement. It may also be possible to incorporate these data into a measure of the strength of family history of suicide, similar to a Reed's score (355) as a component of dose of bereavement. It is also important to explore whether other key variables influence the effect of mode of death on risk of adverse outcomes (106).

5.8.1.2 Analysis of routine datasets

It will be important to retest this study's main hypothesis in routine datasets to determine whether findings are consistent, and to explore associations with completed suicide. Suitable databases include linked population registries covering populations in Canada (71), Denmark (59;60) (100;101) (28;56;193) and Sweden (70;194-197). Use of the APMS datasets from 2000 and 2007, and eventually 2014, would allow statistical comparison with a non-bereaved control group of a similar age in relation to lifetime suicidal ideation, suicide attempts, and non-suicidal self-harm (274;275). With appropriate coding of free text fields it would also be possible to test my hypothesis in The Health Improvement Network (THIN) of UK primary care data, which has previously been interrogated in relation to other bereavements (23;34).

With population-based incidence data it might be possible to determine the population attributable risk (PAR) of suicide bereavement; that is, the risk of suicide attempt associated with suicide bereavement that is in addition to and isolated from the risk of transmitted family history of suicide. This would be of clinical use when deciding, for example, which of the following patients were at highest risk: an 18 year old suicidal male with a family history of suicide in a father who died before he was born, and an 18 year old suicidal male who recently lost a school-friend to suicide. As suicide bereavement is not preventable *per se*, it would not be possible to eliminate the PAR but to reduce it through specific interventions. However quantification of the PAR of this and other risk factors would assist policy-makers in deciding on the allocation of resources to a range of suicide prevention interventions.

5.8.1.3 Other primary quantitative work

My systematic review of previous research on the impact of suicide bereavement (102) highlighted a lack of studies describing the impact of suicide on specific kinship groups, as many studies had been conducted in relation to mixed kinships. Completed suicide had been investigated in relation only to suicide of a spouse (59) (60) or child (60;100). Similarly, risk of suicide attempt (using standardised instruments) had been investigated only in relation to offspring suicide (71). No standardised instrument had been used to investigate group differences in suicidal ideation. There was a striking lack of studies on adolescent peer suicide using

bereaved controls. It will be important to design studies sampling people bereaved by a specific kinship, to explore how different modes of bereavement affect outcomes. Routine databases will also be useful for this purpose.

My systematic review and Methods section highlighted the lack of a standardised measure of closeness, with previous studies relying on subjective perceptions (309) or kinship distinctions (353). The results of this study, and specifically the interaction tests, indicate that risks of adverse outcomes are the same whether the bereaved person was related or unrelated to the deceased. In this sample closeness was only weakly collinear with kinship, and it is possible that the magnitude of the risk of adverse outcomes may vary by closeness to the deceased. It would be a valuable exercise to further develop and validate a measure of closeness to a deceased person, and use it to test this specific hypothesis.

The increased risk of mortality after any bereavement is hypothesised to be explained in part by alcohol-related illnesses (20), but more evidence is required to support this. My systematic review of studies measuring the impact of suicide bereavement (102) found only five studies that had collected data on alcohol and substance misuse, but four had methodological problems. One did not adjust findings for pre-bereavement substance misuse (227), two used unstandardised measures of substance misuse (209;217), and one did not report outcomes collected on change in alcohol use (132). A high-quality Canadian registry study found that even before their child's suicide, parents had a higher risk of alcohol misuse disorder than non-bereaved controls. However their risk of drug or alcohol misuse did not significantly increase after the suicide, and was not significantly higher than that for non-bereaved controls or for parents bereaved by a child's motor vehicle crash (71). An uncontrolled UK study of 86 people bereaved by the suicide of an older adult found that alcohol intake had increased in 14% and had risen to hazardous levels in 7% (132). There is a need for further controlled studies in other populations to investigate the role of substance misuse in explaining risk of suicide attempt, particularly as substance misuse itself may be stigmatised.

In the introductory chapter I mentioned the limited evidence describing the impact of patient suicide on the emotional health of mental health professionals (103;104). I

plan a survey of UK clinical professionals bereaved by a client's death by suicide, sudden natural causes, or sudden unnatural causes, comparing the effects of each on mental health and social functioning, and also using a non-bereaved control group. This study might also be a good opportunity to use mixed methods to further develop and validate the occupational outcome measure used in my cross-sectional study (drop-out from work or education) to accommodate other dimensions of occupational functioning.

5.8.1.4 Follow-up study

In the Methods chapter I briefly described the follow-up study I had conducted in 2013, involving approximately a quarter of the original sample. I plan to analyse these data in my post-doctoral fellowship, to describe in more detail the help-seeking behaviour of young people during episodes of suicidal crisis. The focus of this study is on people with a history of suicidal behaviour, but as all respondents will have been exposed to sudden bereavement (either before or after the onset of suicidality) the findings will be of particular relevance to bereaved people with suicidal thoughts. There is also scope to conduct another follow-up study of the original bereaved sample, to further explore the effect of time on group differences.

5.8.2 Qualitative research:

5.8.2.1 Analysis of bereavement study data

I described the post-doctoral analysis plan for the qualitative data collected in this study in the Methods chapter. There are a number of research questions to address in analysing these data, as described here.

5.8.2.1.1 Development of a theoretical framework

Analysis of the interview data will help provide a theoretical framework for the associations observed, in terms of providing explanations for why people bereaved by suicide may struggle specifically with social and occupational functioning, perceive stigmatising attitudes, and in some cases choose suicide attempt as a coping strategy. Similarly it will help to understand why those bereaved by non-suicide violent deaths also struggle with stigma and share a similar risk of suicide attempt. Stigma is likely to be a key focus of this analysis given that it explains the associations described. The examples provided of stigma, of bereaved people being

avoided, and of them avoiding help-seeking will help illustrate how these adverse outcomes might arise. The particular research questions are:

- What is the nature of the subjective stigma reported by those bereaved by suicide?
- In what ways does this differ in nature or intensity for those bereaved by sudden unnatural deaths?
- In what way does sudden bereavement impact on social and occupational functioning?
- What are the pathways through which people bereaved by suicide or other unnatural causes might decide to end their lives?

Following thematic analysis of the data, further input will be sought from the 1,513 bereaved people (282 bereaved by suicide) who volunteered in the survey to participate in future work. I will email them a summary of themes arising from the qualitative analysis and seek their comments on how this representation resonates with their own experiences.

5.8.2.1.2 Aspects of functioning

I have specific research questions to answer about the nature of difficulties in day-to-day functioning experienced by people bereaved by suicide. These are addressed by responses to specific questions in the online survey, allowing me to investigate the nature of the impact of suicide bereavement on the following areas: substance use; relationships; finance; spirituality; education and work; stigma and concealment of information about the death; a fear of dying the same way; and specific experiences of a memorial service and/or inquest.

5.8.2.1.3 Identifying acceptable interventions

The suicide prevention strategy for England (110) is vague on the issue of the specific support that should be provided to people bereaved by suicide, mainly because so few interventions have been shown to be effective (119). Thematic analysis of the online and interview data will help describe the help-seeking preferences of people bereaved by suicide, comparing them with those of people bereaved by non-suicide sudden deaths. It will also be important to identify

appropriate timing for support, given previous work showing that offers of help may need to be reissued repeatedly, until such time as they might be welcome (292). Such analyses will answer the following research questions:

- What kinds of support and information are acceptable for people bereaved or affected by suicide, and indeed those bereaved by other sudden causes of death?
- What type of support is currently available to these groups?
- Are there group differences between what is available and what is acceptable?
- When should support best be provided following suicide bereavement?

It will also be instructive to compare these expressed help-seeking preferences to observed help-seeking behaviour, as described in an exploratory analysis of the quantitative data on help-seeking behaviour (see 5.8.1.1 above). A first coding of the 27 interviews indicates that the bereaved person's social network is the preferred source of support. Second independent coding is required to verify this finding. The results will also be validated by presenting them to those respondents volunteering to participate in future work, as well as other bereaved people in non-HEI settings.

The results of such analyses will be used to identify the components of one or more acceptable interventions perceived to be beneficial. This will facilitate implementation of suicide prevention strategy by identifying the most appropriate and timely emotional and practical support to offer people bereaved by suicide. It will also determine whether preferences are shared by those bereaved by non-suicide violent causes, suggesting that similar services should be offered to this group. The next stage will be to design a cost-effectiveness study to measure the effects of any such interventions on suicide attempts, social and occupational functioning, mental health outcomes, and reported stigma.

5.8.2.2 Other qualitative work

This Discussion has identified a number of other research questions that would best be answered using qualitative study designs. Given the possibility that embarrassment explains why people tend to avoid those who experience a sudden

bereavement, it would be instructive to conduct qualitative interviews or focus groups with non-bereaved people to determine levels of social competence when communicating with bereaved people. This work would also describe attitudes towards those who experience a violent bereavement, to determine the nature of any stigmatising attitudes. It would be interesting to design a study in which a person who has been bereaved violently is asked to nominate their most supportive friend and their least supportive friend for a face-to-face interview with a researcher masked to status. This would allow the attitudes of those in each dyadic pair to be compared, controlling for the precise nature of the death.

Although suicides and accidental deaths tend to be classified as unexpected deaths, it is possible that many such deaths are anticipated due to long-standing mental illness and/or risk-taking behaviour (68). It would be informative to conduct qualitative research with people bereaved by suicide and by accidental deaths to determine the extent to which they had worried about risk-taking behaviour and anticipated tragic outcomes. This qualitative work might be used to develop and validate a measure of expectedness, which might have clinical utility in screening bereaved people if quantitative work showed that outcomes differed according the level of expectedness of the death.

The development of an intervention to support bereaved individuals would be guided by further qualitative work with specific ethnic groups. This is because the language of suicide differs across ethnic groups (377) and culture is likely to influence preferences for help. Stereotypical views that Asian families will 'look after their own' may result in inadequate provision of support, and interventions may need to be designed so as not to alienate certain groups (378). It would also be instructive to conduct further qualitative work to investigate the views of British people towards those bereaved violently, and how this moderates the support they might offer people bereaved by different causes. Findings might contribute towards a feasibility study of an intervention to change attitudes and behaviour towards those bereaved violently.

5.8.3 Interventional studies

The qualitative analyses described above will determine the design of any subsequent interventional studies. A first coding of the interview data showed that bereaved

people prefer to consult family and friends after a sudden loss. If this is confirmed by independent second coding, it would suggest that further work is needed to develop training for any member of the public who wishes to gain confidence in responding appropriately to a bereaved person. It may be possible to adapt the mental health first aid training model, which has been developed to give members of the public competence in responding to someone who is suicidal (379). Bereavement organisations such as Cruse Bereavement Care, Brake, Child Bereavement UK, Rainbows UK, and CHUMS (Child Bereavement and Trauma Service) provide such training within schools and occupational settings, but may need funding to extend this or adapt it for specific age groups. These programmes will also require cost-effectiveness evaluation. Other potential resources arising from my study include publication of a lay version of the qualitative analysis, providing practical advice to the public on supporting a suddenly bereaved person, and similar in style for those anticipating a cancer death (380).

Chapter 6 Conclusions

The primary hypothesis under investigation in this study was that young adults bereaved by suicide would report higher rates of post-bereavement suicidal thoughts and attempts than young adults bereaved by other causes of sudden death. This hypothesis was supported when comparison was made with bereavement due to sudden natural causes, in that suicide bereavement carried a higher risk of suicide attempt but not of suicidal ideation. The specific outcomes distinguishing suicide bereavement from bereavement by sudden natural causes were greater risk of suicide attempt and poor occupational functioning, and higher levels of subjective stigma, shame, responsibility and guilt.

My hypothesis was rejected when comparison was made with bereavement due to sudden unnatural causes; a comparison that controlled for the violent nature of the death and showed no group differences. The only outcome distinguishing these two groups was an elevated risk of poor social functioning in the suicide-bereaved, together with significantly higher levels of subjective stigma, shame, responsibility and guilt. Young adults bereaved by suicide and by sudden unnatural causes appear to have similar vulnerabilities in relation to suicide-related outcomes, occupational functioning and depression.

A secondary hypothesis, that stigma explained any excess risks in those bereaved by suicide, was supported in that higher rates of stigma appeared to explain the increased risks of adverse outcomes. However, it is possible that stigma may be a marker for lack of support. Another secondary hypothesis, that any elevated risks would be present in both relatives and non-relatives was also supported. Finally, a secondary hypothesis that outcomes for the group bereaved by unnatural causes would be intermediate to the other two groups was supported only in relation to the outcomes stigma and shame.

This study tested a clear hypothesis, derived from current clinical, cultural and policy concerns. My finding that bereavement by suicide or by sudden unnatural death are both risk factors for suicide attempt is clinically important and suggests the need to add a further screening question to the standard suicide risk assessment. It also has

policy relevance in identifying an additional group at risk for inclusion in the suicide prevention strategy for England. My systematic review shows that the findings of my cross-sectional study are consistent with other recent studies, and other reviews highlight the lack of evidence-based interventions for people bereaved suddenly. Analysis of my quantitative and qualitative data in relation to help-seeking behaviour and preferences will help identify acceptable interventions perceived to be beneficial, which should then be evaluated for cost and effectiveness.

Chapter 7 Appendices

7.1 Appendix 1: Oral & poster presentations of progressive stages in the UCL Bereavement Study

Oral presentations

UCL Mental Health Sciences Unit Departmental Academic Meeting 14 January 2010 (upgrade seminar). When a close friend or relative dies by suicide: the impact on mental health and social functioning of young adults

6th Annual Barts and the London Bereavement Conference 18 June 2010, London. Research methods for measuring the impact of sudden bereavement: the results of a pilot study with Cruse Bereavement Care and Samaritans

Survivors of Bereavement by Suicide Support Day 19 June 2010, London. Measuring the impact of bereavement by suicide: the results of a pilot study with Cruse Bereavement Care and Samaritans

UCL Faculty of Brain Sciences Trainee Clinical Academics monthly meeting, 3 September 2010. Measuring the impact of bereavement by suicide: the results of a pilot study with Cruse Bereavement Care and Samaritans

Camden Social Workers Mental Health and Child Care Lunchtime Workshop, 18 November 2010, London. The experience of suicide bereavement: the results of a survey conducted with Cruse Bereavement Care and Samaritans

Camden Joint Management Meeting Adult Mental Health and Family Services and Social Work 25 November 2010, London. The experience of suicide bereavement: the results of a survey conducted with Cruse Bereavement Care and Samaritans

18th British Isles Workshop on Research on Suicide and Deliberate Self Harm, 15 November 2011, University of Oxford. When a close friend or relative dies by suicide: an approach to measuring the impact of suicide bereavement on young adults

Child Bereavement Charity Symposium: The Impact of Suicide on Families 15 May 2012, London. Measuring the impact of suicide bereavement in young people

Brake Sudden Death Forum Seminar – Supporting Suddenly Bereaved Children and Young People 4 October 2012, London. Sudden bereavement: how children and young people are affected. http://www.suddendeath.org/help-for-professionals/papers-and-reports?id=71

UCL/Royal Free Higher Trainees in Psychiatry Academic Meeting 14 November 2012. The impact of suicide bereavement on the mental health and social functioning of young adults: results of a national survey.

UCL Mental Health Sciences Unit Departmental Advisory Group 11 September 2013. Is suicide bereavement a risk factor for suicide attempt? A national cross-sectional survey of young adults.

20th British Isles Workshop on Research on Suicide and Deliberate Self Harm, 18th September 2013, University of Oxford. Lancet Symposium: Is suicide bereavement a risk factor for suicide attempt? A national cross-sectional survey of young adults

Royal College of Psychiatrists General Adult Psychiatry Faculty Annual Conference, 10 October 2013, Manchester. Is suicide bereavement a risk factor for suicide attempt? A national cross-sectional survey of young adults

International Congress of the Royal College of Psychiatrists 2014, London 25 June 2014. Bereavement by suicide. http://www.rcpsych.ac.uk/pdf/IC14%20S19%20Pitman%20Alexandra.pdf

European Symposium on Suicide and Suicidal Behaviour. Tallinn, Estonia. 27-30 August 2014. https://www.dropbox.com/s/zh4eru6hk9bi8py/ESSSB%20abstraktid_FINAL.pdf?dl=0

- Exposure to suicide bereavement and risk of suicide attempt: a national cross-sectional survey of young adults in the UK
- The impact of suicide bereavement on mental health and suicide mortality: a systematic review of controlled studies

21st British Isles Workshop on Research on Suicide and Deliberate Self Harm, 11th September 2014, University of Oxford. Effects of sudden unnatural bereavement on mental health and suicide risk: an update

Poster presentations

International Congress of the Royal College of Psychiatrists 12-13 July 2012, Liverpool. The impact of suicide bereavement: preliminary results of a national survey of young adults.

European Symposium on Suicide and Suicidal Behaviour. Tel Aviv-Jaffa 3-6 September 2012. The impact of suicide bereavement: preliminary results of a national survey of young adults (runner-up in poster prize).

Royal College of Psychiatrists General and Community Psychiatry Faculty Annual Conference, London. 11-12 October 2012. The impact of suicide bereavement: preliminary results of a national survey of young adults. (Winner of poster prize 2012)

UCL Faculty of Brain Sciences Faculty Postgraduate Poster Symposium. 31 January 2013. The impact of suicide bereavement: results of a national survey of young adults

Lancet/UCL/LSHTM Public Health Science Conference, London. 29 November 2013. The effect of suicide bereavement on suicidal behaviour: a national cross-sectional survey of young adults in the UK http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(13)62506-4/abstract

Lancet /Academy of Medical Sciences Spring Meeting for Clinician Scientists in Training, London. 26 February 2014. Suicide bereavement and risk for suicide attempt: a national cross-sectional survey of young adults. http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)60345-7/abstract

7.2 Appendix 2: Publications arising from thesis

Pitman A. & Osborn DPJ (2011) Cross-cultural attitudes to help-seeking among individuals who are suicidal: new perspective for policymakers *British Journal of Psychiatry* 199 (1): 8-10. http://bjp.rcpsych.org/content/199/1/8.full

Pitman A. (2012) Reform of the coroners' service in England and Wales: policy-making and politics. *The Psychiatrist* 36:1-5 http://pb.rcpsych.org/content/36/1/1.full

Pitman A. Krysinska K. Osborn D. King M. (2012) Suicide in young men. *The Lancet* 379(9834):2383-2392 http://www.lancet.com/journals/lancet/article/PIIS0140-6736(12)60731-4/fulltext#

Pitman A. Caine E. (2012) The role of the high-risk approach in suicide prevention. *British Journal of Psychiatry* 201(3): 175-177; http://bjp.rcpsych.org/content/201/3/175.full

Pitman A. Caine E. (2012) High-risk strategies versus universal precautions against suicide (Authors' reply) *British Journal of Psychiatry* 201(5): 410-411 http://bjp.rcpsych.org/content/201/5/410.2.full

Pitman A. (2013) Trauma, bereavement, and the creative process: Arshile Gorky's The Artist and His Mother. *Advances in Psychiatric Treatment* 19(5): 366-369; http://apt.rcpsych.org/content/19/5/366.full

Pitman A. Osborn D. King M. Erlangsen A. (2014) Effects of suicide bereavement on mental health and suicide risk *The Lancet Psychiatry*, 1: 86-94 http://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(14)70224-X/fulltext

Pitman A. Stevenson F. (in press) Suicide reporting within British newspapers' arts coverage: content analysis of adherence to media guidelines *Crisis: The Journal of Crisis Intervention and Suicide Prevention*

Pitman A. Osborn D. King M. (in press for 2015) The use of internet-mediated cross-sectional studies in mental health research. *Advances in Psychiatric Treatment*

7.3 Appendix 3: Systematic review of the effect of suicide bereavement on mental health and suicide risk

- Appendix 3a: CD-ROM contains pdf copy of Pitman et al (2014) Effects of suicide bereavement on mental health and suicide risk *The Lancet Psychiatry* 1:86-94
- Appendix 3b: CD-ROM contains pdf copy of *The Lancet Psychiatry* Online appendix (Search strategy; Studies using non-bereaved controls; Table of studies included in review)

7.4 Appendix 4: Systematic review of the epidemiology of suicide in young men

- CD-ROM contains pdf copy of Pitman et al (2012) Suicide in young men *The Lancet* 379(9834):2383-2392

7.5 Appendix 5: Confirmation of ethics approval

- CD-ROM contains pdf copy of UCL Research Ethics Committee approval (July 2009)

7.6 Appendix 6: Table of responses by UK HEI

The tables that follow give the responses of:

- each HEI to the initial invitation to participate
- individuals in each HEI consenting to participate

Key to Appendix 6a: Table of responses by UK HEIs:

N = no reply
R=refused
C=consented

Appendix 6a: Table of responses by UK HEIs

HEI (those in Bold were Russell Group HEIs in 2010)	Response
ENGLAND (n=130)	
Anglia Ruskin University	R
Aston University	N
Bath Spa University	N
The University of Bath	R
University of Bedfordshire	A
Birkbeck College	R
Birmingham City University	N
The University of Birmingham	**N**
University College Birmingham	R
Bishop Grosseteste University College Lincoln	A
The University of Bolton	N
The Arts University College at Bournemouth	N
Bournemouth University	A
The University of Bradford	N
The University of Brighton	N
The University of Bristol	R
Brunel University	R
Buckinghamshire New University	N

The University of Buckingham	R
The University of Cambridge	**N**
The Institute of Cancer Research	N
Canterbury Christ Church University	R
The University of Central Lancashire	N
Central School of Speech and Drama	A
University of Chester	A
The University of Chichester	N
The City University	A
Conservatoire for Dance and Drama	R
Courtauld Institute of Art	A
Coventry University	R
Cranfield University	A
University for the Creative Arts	N
University of Cumbria	A
De Montfort University	A
University of Derby	N
University of Durham	N
The University of East Anglia	N
The University of East London	R
Edge Hill University	N

The University of Essex	N
The University of Exeter	N
University College Falmouth	N
University of Gloucestershire	R
Goldsmiths College	R
The University of Greenwich	A
Guildhall School of Music and Drama	N
Harper Adams University College	R
University of Hertfordshire	R
Heythrop College	N
The University of Huddersfield	N
The University of Hull	N
Imperial College	R
Institute of Education	N
The University of Keele	R
The University of Kent	R
King's College London	A
Kingston University	R
The University of Lancaster	R
Leeds College of Music	N
Leeds Metropolitan University	N

The University of Leeds	A
Leeds Trinity University College	N
The University of Leicester	N
The University of Lincoln	N
Liverpool Hope University	R
Liverpool John Moores University	A
The Liverpool Institute for Performing Arts	A
The University of Liverpool	A
University of the Arts, London	R
London Business School	R
London Metropolitan University	A
London South Bank University	R
LSE	R
LSHTM	R
Loughborough University	N
The Manchester Metropolitan University	N
The University of Manchester	**N**
Middlesex University	R
The University of Newcastle-upon-Tyne	R
Newman University College	N
The University of Northampton	N

The University of Northumbria at Newcastle	N
Norwich University College of the Arts	A
The University of Nottingham	R
The Nottingham Trent University	R
The Open University	R
Oxford Brookes University	R
The University of Oxford	A
University College Plymouth St Mark & St John	N
The University of Plymouth	N
The University of Portsmouth	N
Queen Mary and Westfield College	N
Ravensbourne	N
The University of Reading	N
Roehampton University	R
Rose Bruford College	N
Royal Academy of Music	N
Royal Agricultural College	N
Royal College of Art	R
Royal College of Music	N
Royal Holloway and Bedford New College	N
Royal Northern College of Music	N

The Royal Veterinary College	A
St George's Hospital Medical School	A
St Mary's University College, Twickenham	N
The University of Salford	N
The School of Oriental and African Studies	A
The School of Pharmacy	N
Sheffield Hallam University	N
The University of Sheffield	**N**
Southampton Solent University	R
The University of Southampton	A
Staffordshire University	A
University Campus Suffolk	A
The University of Sunderland	N
The University of Surrey	R
The University of Sussex	R
The University of Teesside	N
Thames Valley University	R
Trinity Laban Conservatoire of Music & Dance	A
University College London	A
The University of Warwick	R
University of the West of England, Bristol	N

The University of Westminster	A
The University of Winchester	N
The University of Wolverhampton	R
The University of Worcester	A
Writtle College	N
York St John University	N
The University of York	N
WALES (n=11)	
Aberystwyth University	N
Bangor University	N
Cardiff University	A
University of Wales Institute, Cardiff	A
University of Glamorgan(	R
Glyndŵr University	N
The University of Wales, Lampeter	N
The University of Wales, Newport	N
Swansea Metropolitan University	R
Swansea University	N
Trinity University College	N
SCOTLAND (n=19)	
The University of Aberdeen	R

University of Abertay Dundee	N
The University of Dundee	A
Edinburgh College of Art	N
Edinburgh Napier University	N
The University of Edinburgh	R
Glasgow Caledonian University	N
Glasgow School of Art	N
The University of Glasgow	R
Heriot-Watt University	A
Queen Margaret University, Edinburgh	A
The Robert Gordon University	N
Royal Scottish Academy of Music and Drama	N
The University of St Andrews	R
Scottish Agricultural College	A
The University of Stirling	N
The University of Strathclyde	N
UHI Millennium Institute	N
The University of the West of Scotland	R
NORTHERN IRELAND (n=4)	
The Queen's University of Belfast	A
St Mary's University College	N

Stranmillis University College	N
University of Ulster	A

Key: N = no reply ; R=refused ; C=consented

Appendix 6b: Table of responses by HEI consenting to participate

See next page

Key:

* denotes brief sampling email to all staff and students inviting contact with research team

** denotes intranet/email digest method for all staff and students

*** denotes email method for students & intranet/email digest for staff

† denotes student sample only

†† denotes student sample only, invited from 8 of the 38 Colleges and 6 Permanent Private Halls (PPH): Wadham College, Balliol College, University College, Green Templeton College, Oriel College, Wycliffe Hall (PPH), St Benet's Hall (PPH) & Blackfriars Hall (PPH)

Table of responses by HEI consenting to participate

HEI	Total number of students invited	Total number of staff invited	Total number of staff & students invited	Total consents to participate	Overall response (%)
Bishop Grosseteste University College Lincoln	1500	250	1750	38	2.17
Bournemouth University*	45538	4306	49844	31	0.06
Cardiff University	28850	5929	34779	319	0.92
Central School of Speech and Drama	855	160	1015	18	1.77
City University	14694	2009	16703	126	0.75
Courtauld Institute	484	222	706	16	2.27
Cranfield University	4580	1600	6180	9	0.15
De Montfort University**	2999	488	3487	102	2.93

HEI	Total number of students invited	Total number of staff invited	Total number of staff & students invited	Total consents to participate	Overall response (%)
Greenwich University	30000	3000	33000	81	0.25
Heriot Watt University**	8000	1640	9640	9	0.09
King's College London	24500	13060	37560	337	0.9
Liverpool Institute of the Performing Arts	900	300	1200	21	1.75
Liverpool John Moores University	25000	2500	27500	70	0.25
London Metropolitan University	30000	2500	32500	85	0.26
Norwich University College of the Arts	1485	250	1735	38	2.19
Queen Margaret University	5000	0	5000	32	0.64
Queen's University Belfast	10996	3500	14496	373	2.58
Royal Veterinary College	1895	700	2595	31	1.19

HEI	Total number of students invited	Total number of staff invited	Total number of staff & students invited	Total consents to participate	Overall response (%)
SOAS	13382	2012	15394	37	0.24
Scottish Agricultural College	970	67	1037	17	1.64
Staffordshire University	20000	1700	21700	346	1.59
St George's	10917	2175	13092	69	1.53
Trinity Laban Conservatoire of Music & Dance	1000	630	1630	19	1.17
UCL	27559	13380	40939	254	0.63
University Campus Suffolk	5330	350	5680	40	0.7
University of Bedfordshire***	20000	1150	21,150	70	0.33
University of Chester	17063	2353	19416	299	1.54
University of Cumbria***	26100	1200	27300	97	0.36

HEI	Total number of students invited	Total number of staff invited	Total number of staff & students invited	Total consents to participate	Overall response (%)
University of Dundee**	17000	4000	21000	26	0.12
University of Leeds †	35046	0	35046	480	1.37
University of Liverpool ***	22295	4500	26795	288	1.07
University of Oxford ††	3230	0	3230	141	4.37
University of Southampton	23735	5363	29098	343	1.18
University of Ulster	32000	4200	36200	172	0.48
University of Westminster	24186	4811	28997	76	0.26
University of Wales Institute, Cardiff**	13,078	1158	14,236	3	0.02
University of Worcester	16,942	1000	17942	115	0.64
Total denominator	567,109	92,463	659,572	4,628	0.7

7.7 Appendix 7: Online questionnaire & sampling email used in UCL Bereavement Study

- Appendix7a: CD-ROM contains pdf copy of UCL Bereavement Study email invitation 2010
- Appendix7b: CD-ROM contains pdf copy of UCL Bereavement Study questionnaire, as uploaded to the Opinio site hosted by UCL.

7.8 Appendix 8: UCL Bereavement Study website

- CD-ROM contains pdf of screenshot and content of the UCL Bereavement Study website, including the list of bereavement support services: http://www.ucl.ac.uk/psychiatry/researchgroupsareas/bereavementstudy

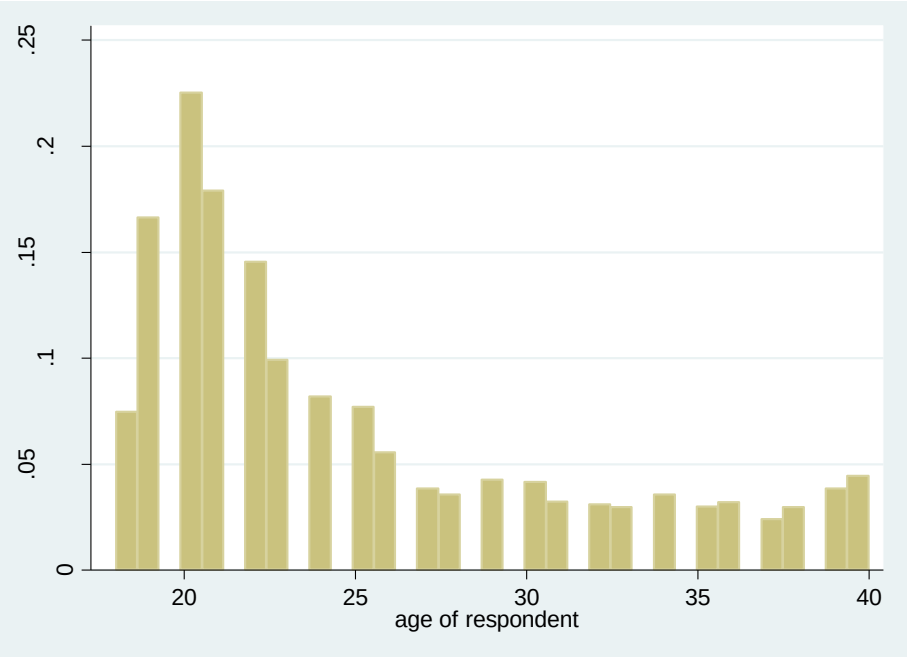
7.9 Appendix 9: Information sheet and consent form for cross-sectional study

- CD-ROM contains pdf of UCL Bereavement Study information sheet & consent form, as available on study website.

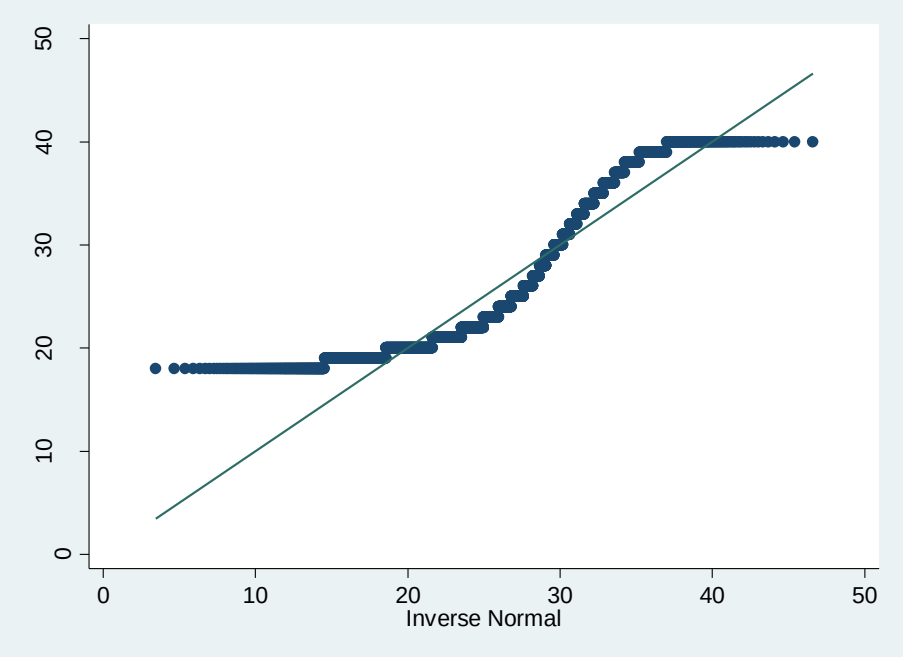
7.10 Appendix 10: Diagnostic distribution of continuous covariates & outcomes

Age

Histogram showing frequency of respondents' ages:

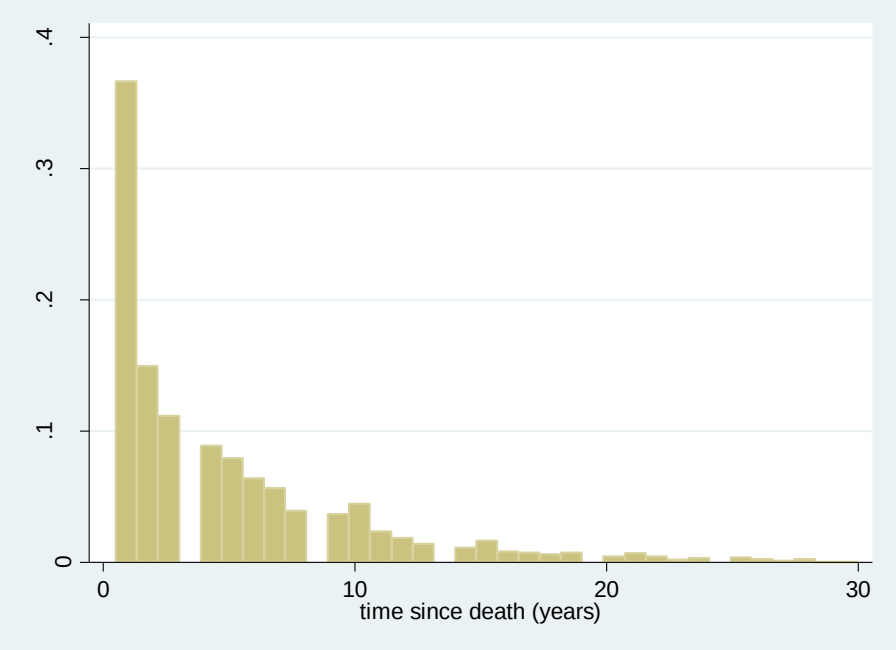


Distributional diagnostic plot for age of respondents:

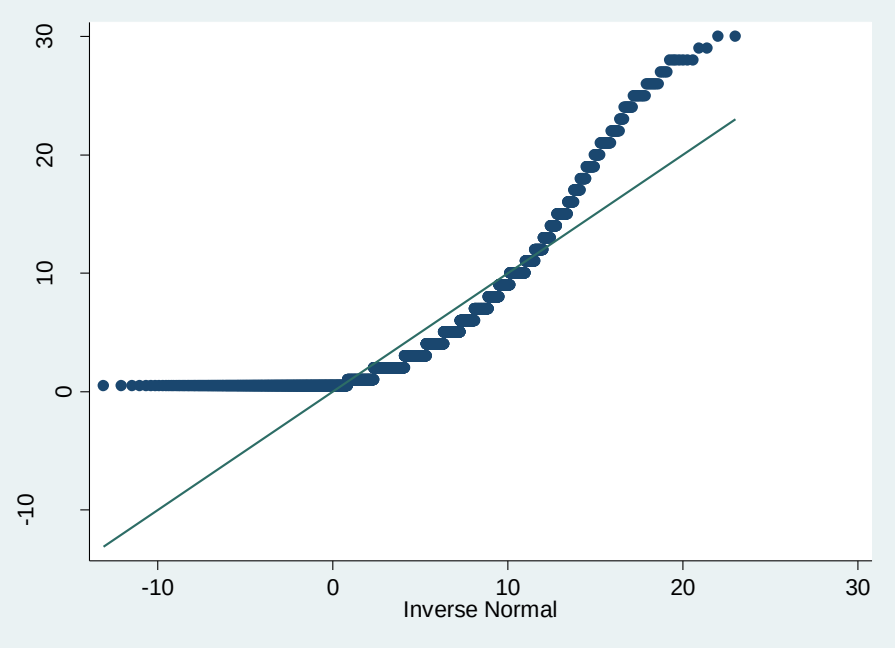


Time since bereavement

Histogram showing frequency of time elapsed since index bereavement:

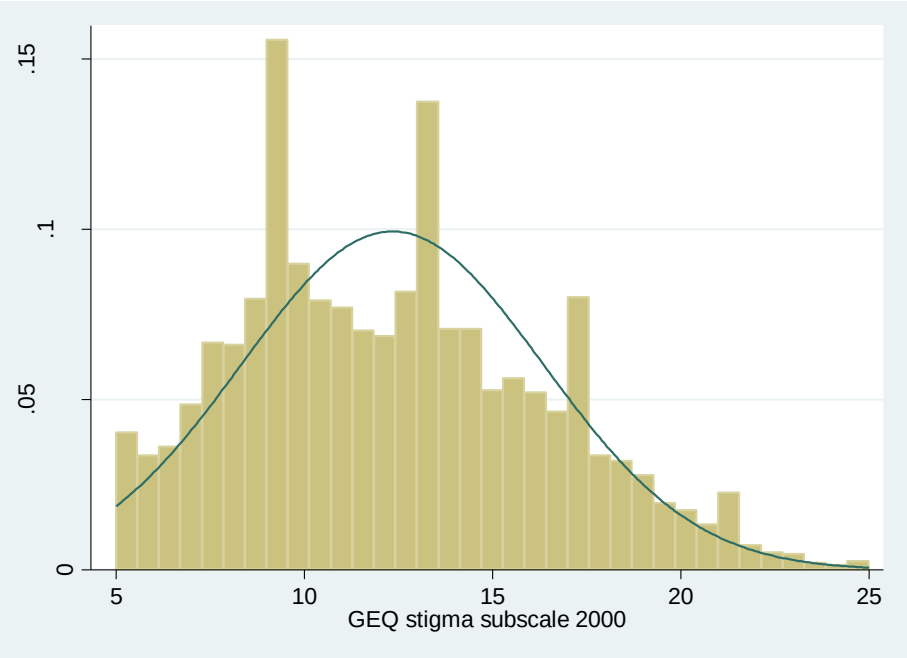


Distributional diagnostic plot for time since bereavement:

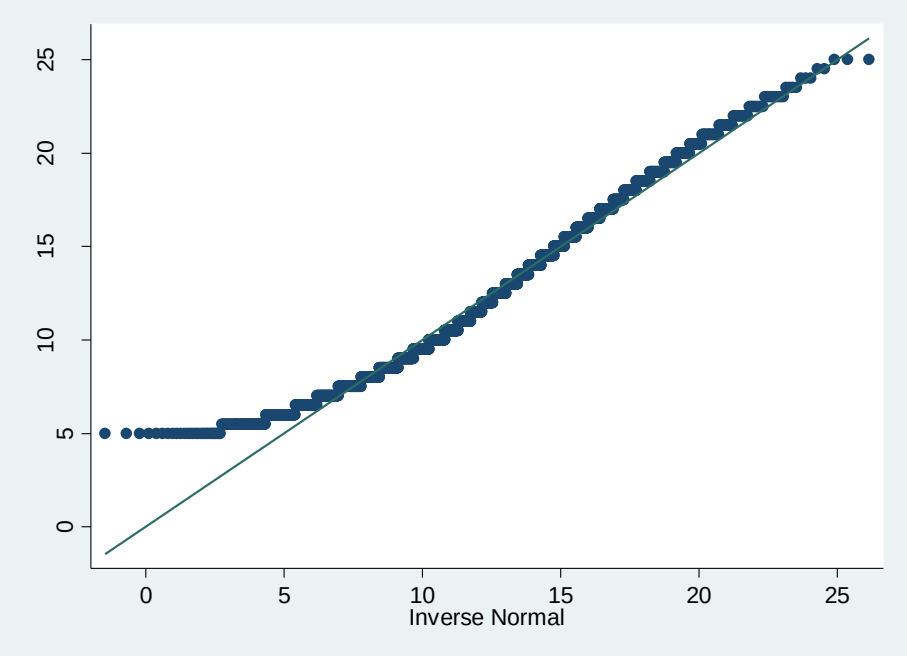


Stigma as a continuous variable

Histogram showing frequency of stigma scores:

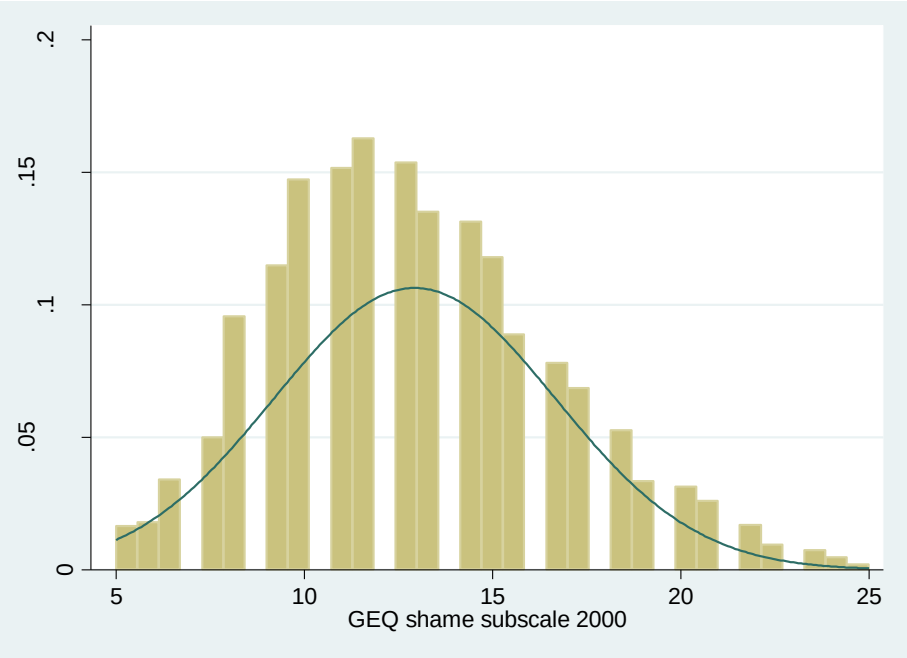


Distributional diagnostic plot of stigma scores:

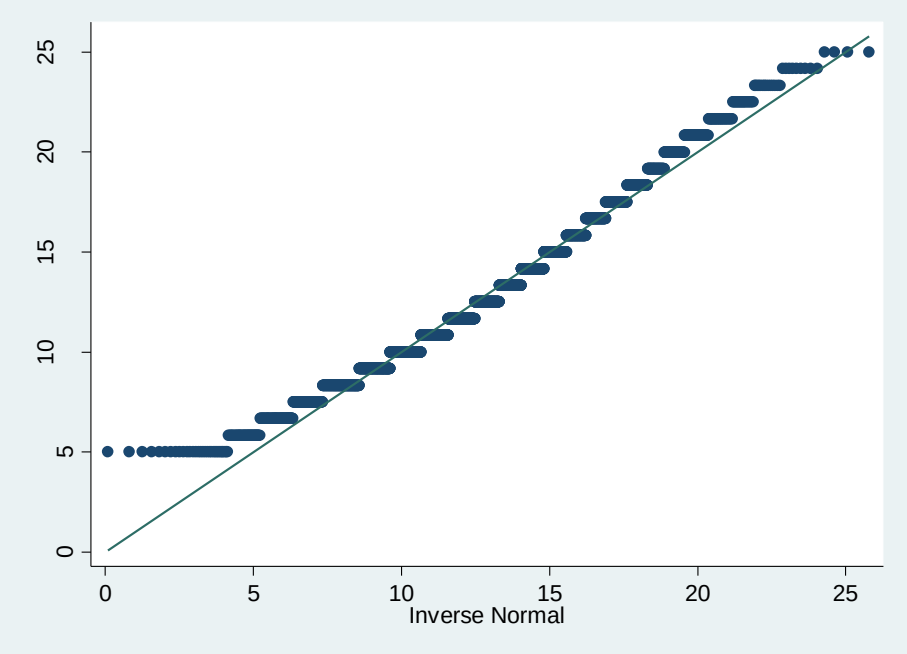


Shame as continuous variable

Histogram showing frequency of shame scores:

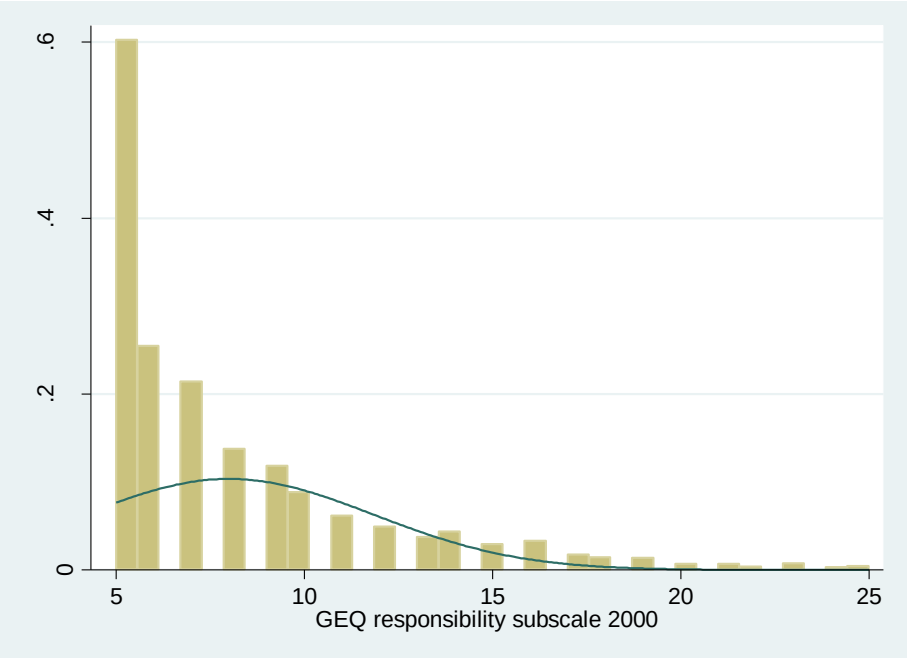


Distributional diagnostic plot of shame scores:

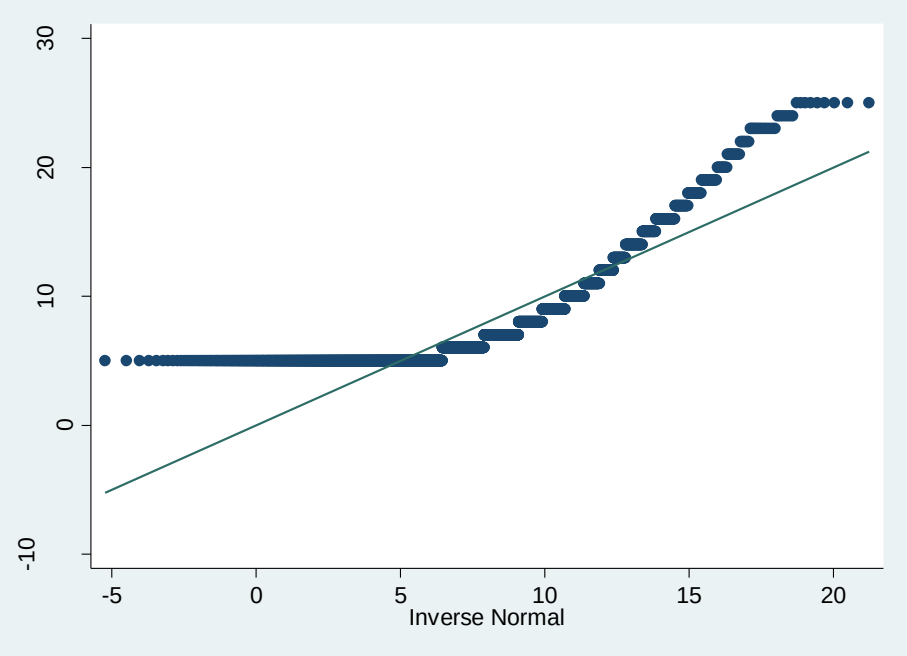


Responsibility as continuous variable

Histogram showing frequency of responsibility scores:

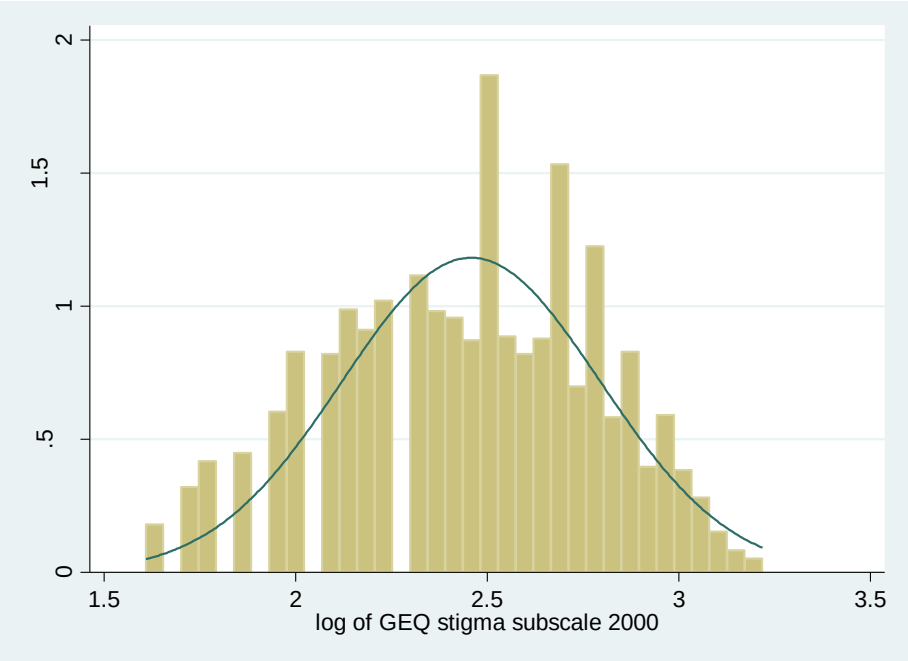


Distributional diagnostic plot of responsibility scores:

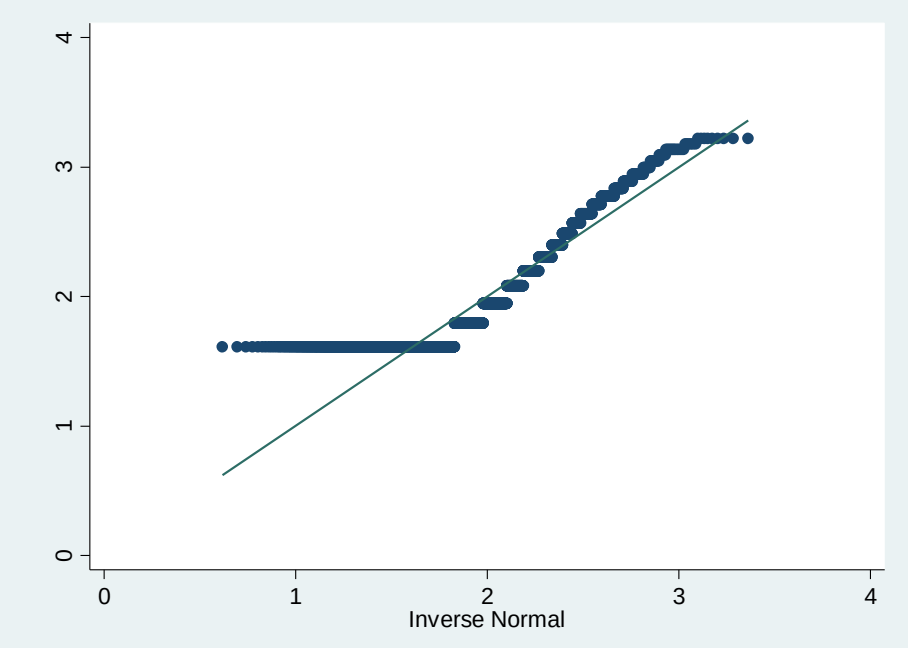


Responsibility transformed to log values

Histogram showing frequency of log responsibility scores:

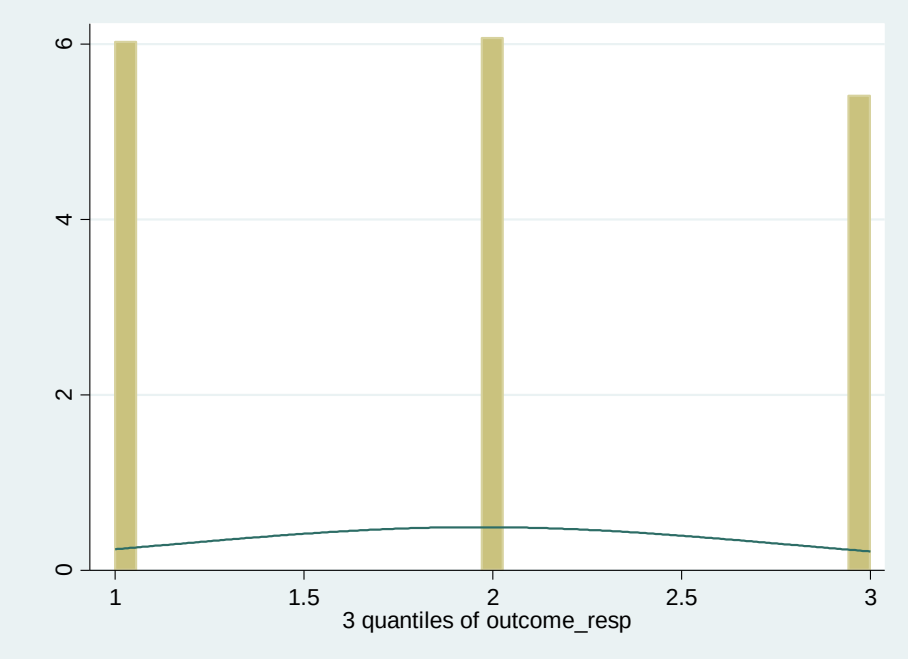


Distributional diagnostic plot of log responsibility scores:

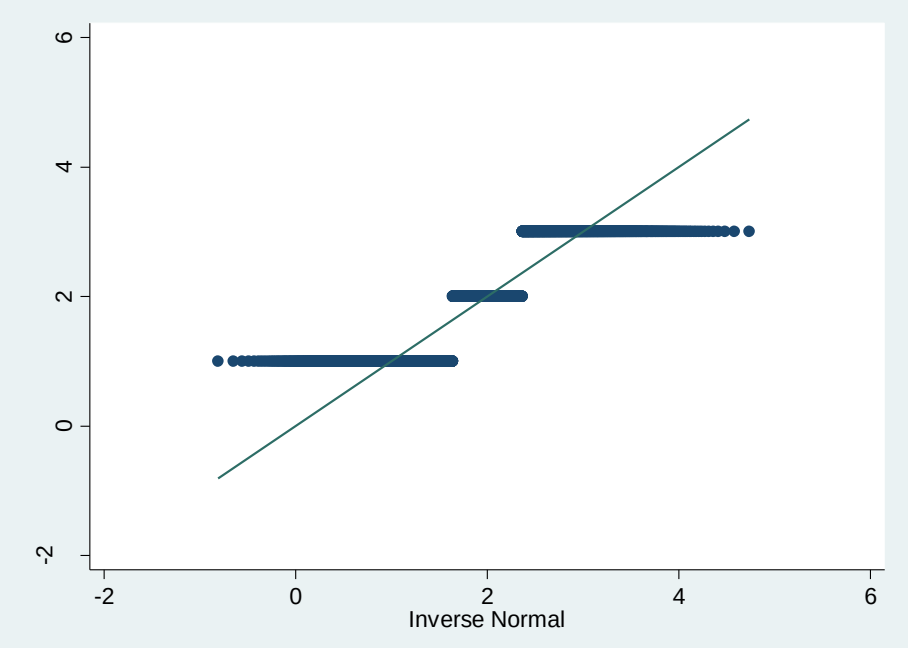


Responsibility transformed to tertiles

Histogram showing frequency of responsibility tertile scores:

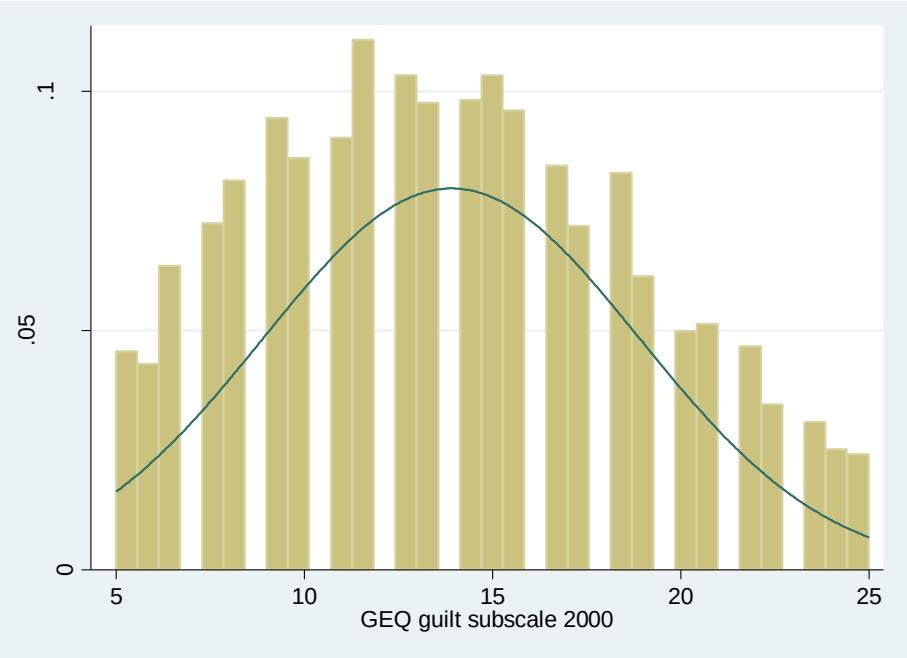


Distributional diagnostic plot of responsibility tertile scores:

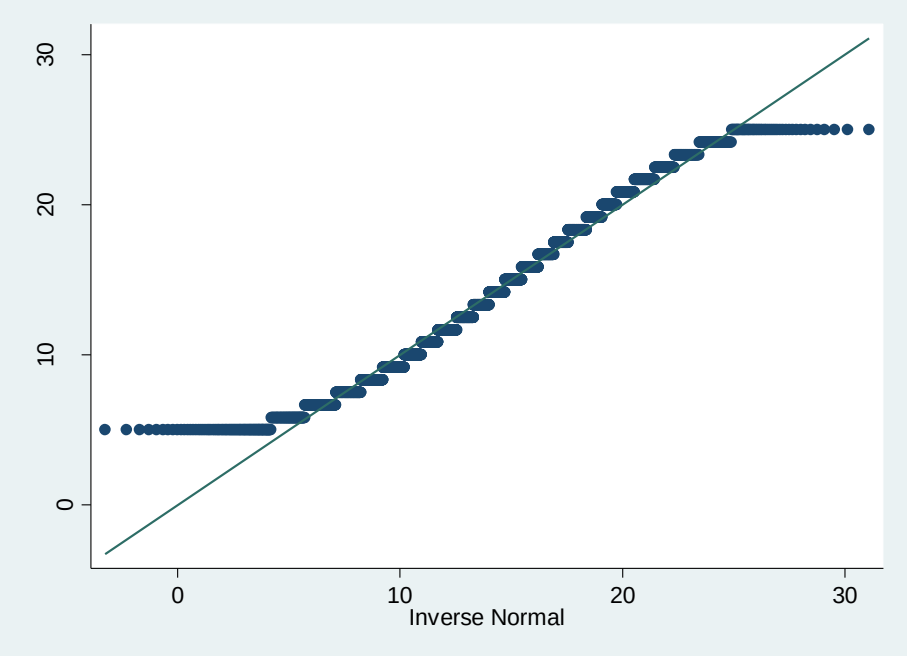


Guilt as continuous variable

Histogram showing frequency of guilt scores:

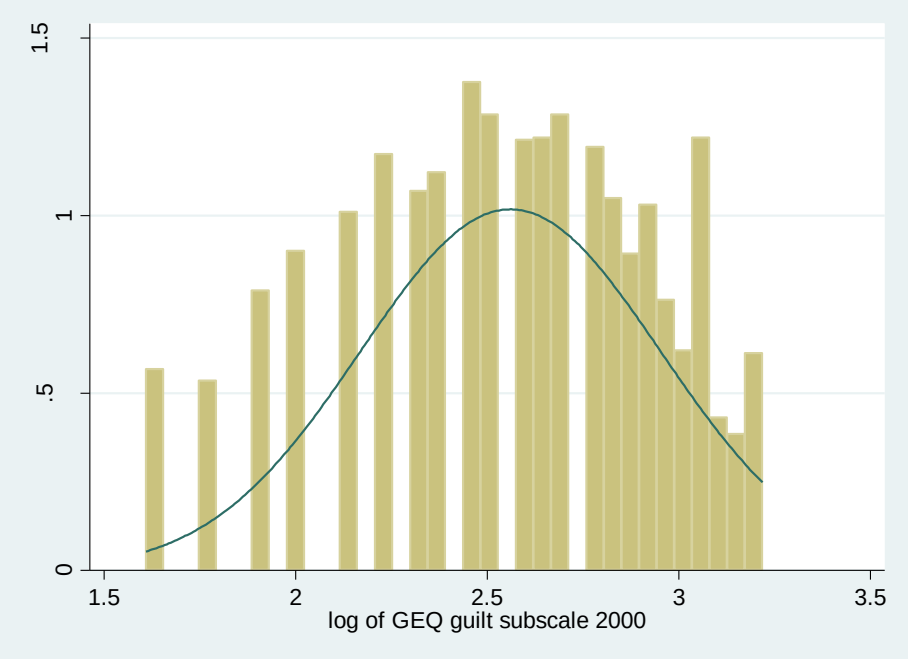


Distributional diagnostic plot for guilt scores:

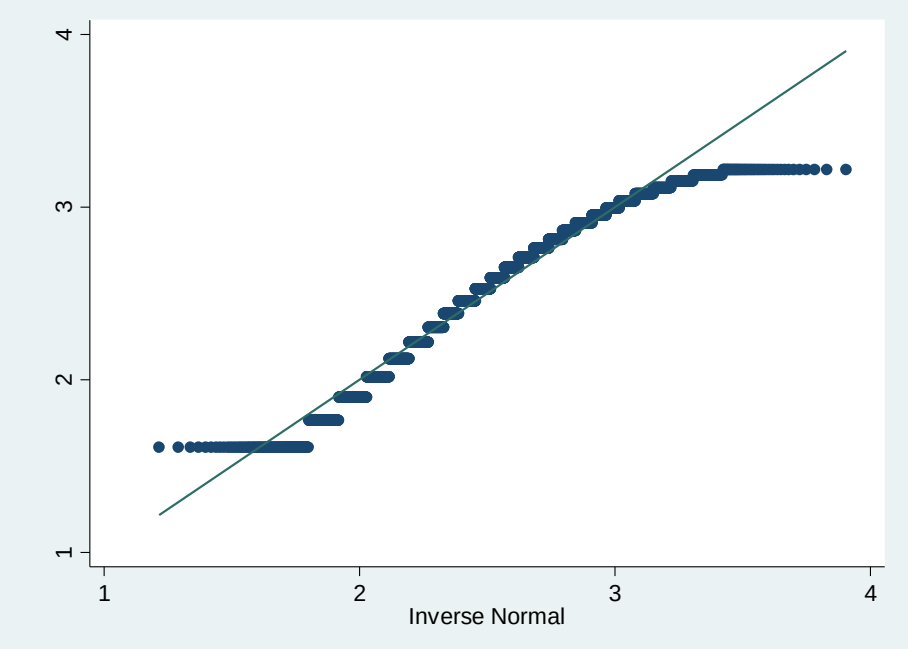


Guilt transformed to log values

Histogram showing frequency of log guilt scores:

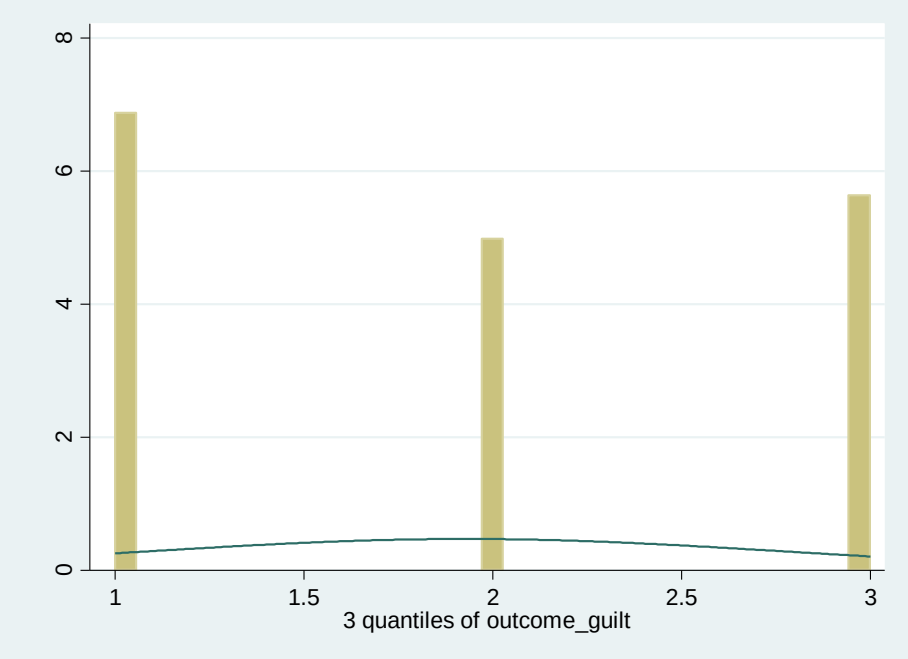


Distributional diagnostic plot for log guilt scores:

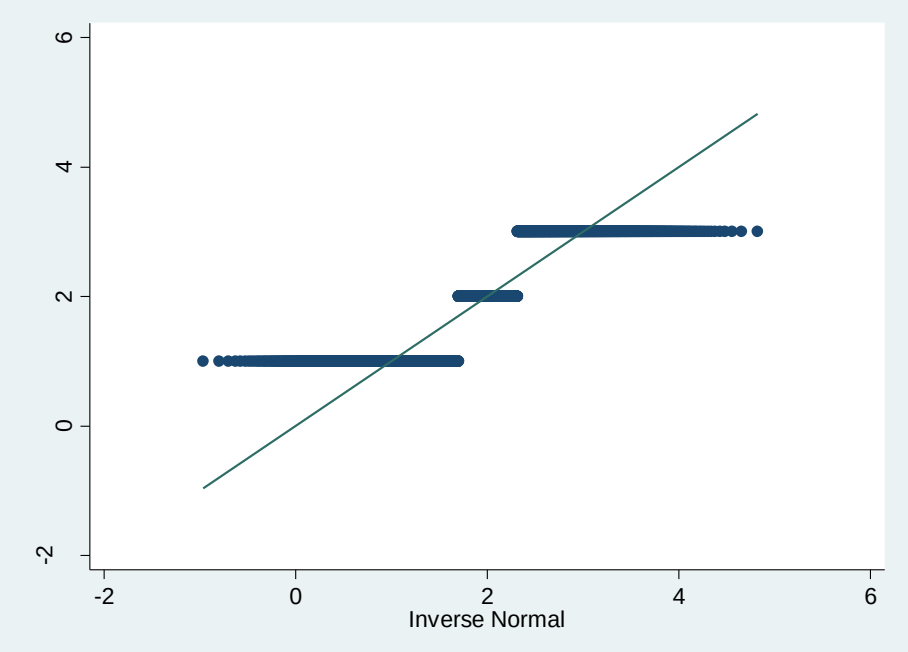


Guilt transformed to tertiles

Histogram showing distribution of guilt tertile scores:



Distributional diagnostic plot of guilt tertile scores:



7.11 Appendix 11: Interview topic guide

Check: Consent form, list of sources of support, digital recording device

Summarise questionnaire: relationship and the nature of the death

How have people around you reacted to your bereavement?

How easy has it been to talk about the death with the people around you?

Impact on relationships:

- Partner/potential partners
- Close friends/potential close friends
- Immediate family
- Wider family
- Others

Impact on other areas:

- Educational progress; work performance; use of alcohol/drugs; finances; spirituality or spiritual beliefs

Other topics:

- Concealed information
- Avoidance of topic
- Hidden grief
- Fear of same death
- Memorial service
- Inquest
- Views on help offered or not offered
- Support available to others instead
- Stigmatising or honouring attitudes: What are your thoughts about society's attitude towards you because of your bereavement?

Specific probes during interview:

"You've talked about a change in your (work output/etc), to what extent do you think this may have been due to the way your (father/brother etc) died?"

"Do you think anything positive has come out of the death?"

"Is there anything you'd like to say with the Dictaphone off?"

"If you met someone who'd had a sudden bereavement how would you communicate with them?"

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